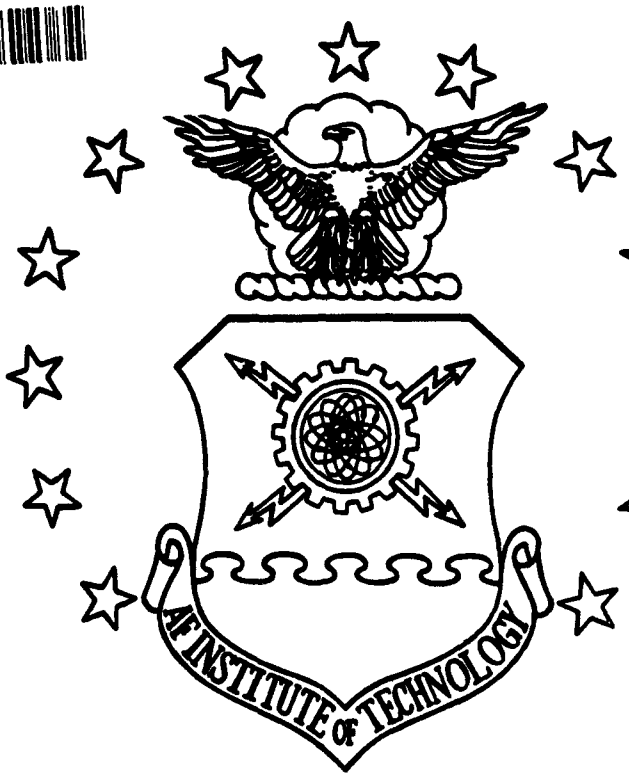

THE APPLICATION OF NEPA REQUIREMENTS TO CERCLA REMEDIAL ACTIONS

THESIS

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AFIT/GEE/ENV/94S-28

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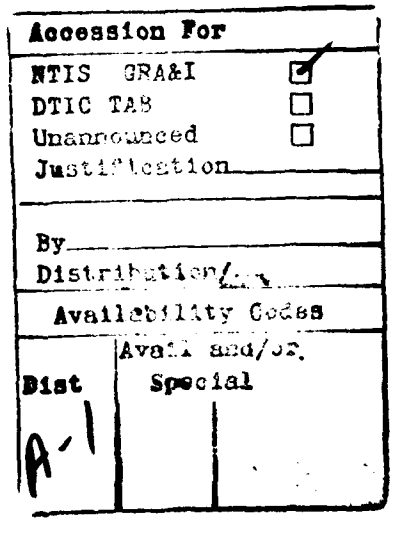

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THE APPLICATION OF NEPA REQUIREMENTS TO CERCLA REMEDIAL ACTIONS

THESIS

Presented to the Faculty of the School of Engineering

of the Air Force Institute of Technology

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In Partial Fulfillment of the

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Master of Science in Engineering and Environmental Management

Connie L. Strobbe, B.S., M.S.

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Preface

Numerous people were instrumental in providing me with guidance and information required in the preparation and writing of this thesis. First, I would like to offer my gratitude to my first thesis adviser, Lt Col Mark Goltz, for all of his assistance during the early phases of my thesis work. I'd like to express my appreciation my second thesis adviser, Capt Jim Aldrich, for all of his probing questions during the research phase of this project. For his wonderful editorial skills I'd like to express my heartfelt thanks to my reader, Mr. Anthony Negri, for all of the time that he so generously donated throughout this lengthy effort. As a part-time student, my thesis time-line was longer than most, and Mr. Negri stuck with me throughout, for which I am extremely grateful. Last but certainly not least, I'd like to thank my husband, Carter de Werd, for his constant moral support throughout this program and for all of his help with computer graphics!

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LIST OF ACRONYMS

AFB	Air Force Base
ARARs	Applicable or Relevant and Appropriate Requirements
ATSDR	Agency for Toxic Substances and Disease Registry
CA	Cost Analysis
CAA	Clean Air Act
CATEX	Categorical Exclusion
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CRP	Community Relations Plan
CWA	Clean Water Act
DD	Decision Document
DERA	Defense Environmental Restoration Account
DERP	Defense Environmental Restoration Program
DOD	Department of Defense
DOE	Department of Energy
EA	Environmental Assessment
EE	Engineering Evaluation
EIS	Environmental Impact Statement
EO	Executive Order
EPA	Environmental Protection Agency
EPF	Environmental Planning Function
FONSI	Finding of No Significant Impact
FS	Feasibility Study

IAG	Interagency Agreement
IRP	Installation Restoration Program
NCP	National Oil and Hazardous Substances Contingency Plan
NEPA	National Environmental Policy Act
NPL	National Prioity List
OSC	On-Scene Coordinator
PA	Preliminary Assessment
PEIS	Programmatic Environmental Impact Statement
POLREPS	Periodic Pollution Reports
RA	Remedial Action
RCRA	Resource Conservation Recovery Act
RD	Remedial Design
RI	Remedial Investigation
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act
SI	Site Investigation
TRC	Technical Review Committee
TSCA	Toxic Substances Control Act
USC	United States Code
VOC	Volatile Organic Compound

THE APPLICATION OF NEPA REQUIREMENTS TO CERCLA REMEDIAL ACTIONS

I. Introduction

1.1 Introduction

This chapter provides a brief discussion of two major environmental laws, the National Environmental Policy Act (NEPA) and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). There is disagreement over the use of CERCLA documentation to satisfy the requirements of NEPA. Some believe that CERCLA documents are functionally equivalent to those required under NEPA (Department of the Air Force, 1992: 3-1; U.S. EPA, 1991: i-ii; Baur, 1986: 1-4). This chapter will examine the issue of functional equivalency and will conclude with four research questions concerning this issue. These questions will be fully addressed in later chapters of this thesis.

1.2 Background

The National Environmental Policy Act (NEPA) of 1969 requires federal agencies to evaluate the potential environmental impacts of their proposed actions and all available alternatives. In order to fully comply with NEPA,

the environmental impact analysis must be accomplished early in the planning phase since NEPA was intended to influence the course of action selected by the federal decision maker (46 FR 18026, 1981: 2712).

A second major objective of NEPA is to ensure that the public has the opportunity to provide input into the federal decision-making process. Public hearings, generally held for every EIS, have provided a formal avenue for the public to i fluence the decisions of federal agencies, and the entire process has made the public far more aware of the power they possess in altering proposed federal actions (Deverman, 1989: 14). Numerous court cases have resulted from federal agency failure to fully comply with the procedural requirements of NEPA and from failure to fully involve the public in this process.

One of three levels of documentation is required by NEPA and its implementing regulations. An environmental impact statement (EIS) is required for every major federal action significantly affecting the human environment. An EIS culminates in a Record of Decision (ROD). An environmental assessment (EA) is prepared when there's uncertainty regarding the need to prepare an EIS. An EA will result in a Finding of No Significant Impact (FONSI), in a decision to prepare an EIS, or in a decision to take no action. Each federal agency is also authorized to develop a

list of categorical exclusions (CATEXs), which must be approved by the Council on Environmental Quality (CEQ) and published in the *Federal Register*. Categorical exclusions are typically granted for minor actions and for those determined by previous EAs to have no single or cumulative significant environmental impacts (48 FR 34263, 1983: 2843).

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), passed ten years after NEPA, was enacted to address hazards posed by past waste disposal sites and current hazardous substance spills. Essentially, a key reason CERCLA was enacted was to provide EPA with the enforcement authority and funding via taxes to clean up past hazardous waste disposal sites throughout the United States and to provide response authority for hazardous substance spills. Special industry taxes, primarily on the petrochemical industry, were used to establish a special Hazardous Substance Superfund.

If there is a substantial threat of a release of a hazardous substance or contaminant into the environment, CERCLA empowers EPA to undertake removal or remedial action using funds from the special Superfund account. The EPA can then seek reimbursement for any funds spent on a site from the owner or operator of the site, the transporter, or the generator of the hazardous waste. Under CERCLA, the EPA can also issue an administrative order or seek a court

injunction ordering the responsible party to conduct the required remedial action (Reed, 1984: 10225). The major stages for a CERCLA remedial action are Remedial Investigation/ Feasibility Study (RI/FS), issuance of a Record of Decision (ROD), Remedial Design (RD), and Remedial Action (RA).

According to the Environmental Protection Agency (EPA), CERCLA has six major goals related to past waste sites:

> 1. Make past waste sites safe. Take immediate action to control acute, imminent threats, and prioritize sites so those which pose the greatest threat are cleaned up first.
>
> 2. Make past waste sites clean over the long term. Quickly implement a long-term remediation strategy.
>
> 3. Use enforcement first to hold the responsible parties accountable, and encourage them to take the lead in remediating sites.
>
> 4. Encourage new and innovative technologies to remediate past waste sites.
>
> 5. Encourage community involvement in the remediation process.
>
> 6. Encourage open communication with the general public (EPA, 1991: 4; EPA, 1992: 1-2).

Prior to the passage of CERCLA, the Department of Defense (DOD) established the Installation Restoration Program (IRP) to address past waste disposal sites on DOD bases. The DOD was not required to comply with CERCLA upon its enactment, although the IRP program was modified to adopt certain components of CERCLA and the NCP after CERCLA's passage. The Superfund Amendments and

Reauthorization Act (SARA) established the Defense Environmental Restoration Program within the Department of Defense (DOD) and required DOD to comply with the same CERCLA and NCP regulations as other federal and nongovernmental agencies. Therefore, the current IRP must comply with all essential elements of both CERCLA and SARA, as well as appropriate Executive Orders and internal Air Force guidance (Casagrande, 1987:1-1).

Like NEPA, extensive documentation and public review are required under CERCLA. Required documentation includes such reports as: Preliminary Assessment (PA), Site Inspection (SI) Report, RI Report, Focused FS, ROD, Preliminary, Intermediate and Final RD, Site Health and Safety Plan, and Project Closeout Report. Under CERCLA, public participation must be actively sought when a ROD is issued. Grants are even made available to facilitate public involvement in this process.

1.3 Issue

The applicability of NEPA to remedial actions conducted under CERCLA has been a matter of controversy for some time (Baur, 1986: 1-4; EPA, 1991: i-ii; Wagner and Benson, 1992: 112). Federal agencies engaged in CERCLA cleanups are not specifically exempted from NEPA compliance, so there is general agreement that the basic requirements of NEPA

must be met (Schlechter, 1989: 4). However, regulatory agencies, such as the Environmental Protection Agency and the Nuclear Regulatory Commission, advocate the viewpoint that they are not required to prepare NEPA documentation for any actions mandated by law if the basic procedures required for decision-making are functionally equivalent to those required under NEPA. This approach has been legally challenged, but lower court decisions seem to support the regulatory agency exemption from NEPA. In Warren County v. North Carolina the county brought action to prevent the siting of a landfill for PCB contaminated soil. One of the arguments the county used was that the U.S. Environmental Protection Agency had not complied with NEPA. However, the U.S. District Court ruled that "under the functional equivalence doctrine, the Environmental Protection Agency was not required to file a formal environmental impact statement" (Warren County v. North Carolina).

Regulatory agencies must still satisfy a number of tests before they can use functional equivalency to avoid separate NEPA compliance. The proposed action must involve protecting the environment, and multiple alternatives for accomplishing this goal must be evaluated. In addition, the regulatory agency must establish some mechanism to notify the public and federal, state, and local agencies of the proposed action, and any public comments received must be

evaluated prior to making a final decision (Bair, 1984: 1). These requirements are met by adhering to the basic requirements of CERCLA.

Controversy has been generated over the use of functional equivalency by non-regulatory federal cies. Some experts believe that the RI/FS can serve as a functional equivalent of an EA/EIS for remedial actions conducted under CERCLA by all federal agencies (Wagner and Benson, 1992: 109-112). Others, however, believe that this concept does not apply to the Air Force since it is neither a regulatory agency nor are its remedial actions managed by EPA since this authority was delegated directly to the DOD by Executive Order 12316 (Bair, 1984: 2).

Another matter of controversy is whether the RI/FS documentation actually includes all of the analysis required under NEPA. While the CERCLA documentation is extensive, many believe that it fails to adequately address all areas of the environment likely to be impacted by remedial actions, particularly natural and cultural resources.

No matter how this issue is legally resolved, it is in the best interest of the Air Force to fully comply with NEPA when undertaking <u>any</u> action at Air Force installations. The intent of Congress when passing NEPA was to influence the federal decision-making process. If the Air Force complies with this requirement for all proposed actions except those

taken under CERCLA, it can create the appearance that Air Force officials are not being forthright and up-front with CERCLA actions. The public could easily mistrust Air Force actions taken under CERCLA when Air Force officials fully comply with NEPA for all other activities, many of which have far fewer environmental consequences than those taken under CERCLA.

1.4 Research Questions

To address these issues, the following research questions are proposed:

1. What is the current official Air Force policy on the applicability of NEPA to CERCLA remedial actions? The Department of Energy (DOE) has initiated CERCLA actions at a number of their sites. What is the DOE policy for applying NEPA to their CERCLA remedial actions?
2. Given the requirements of both laws, does the CERCLA documentation cover all areas of analysis and coordination required by NEPA? If not, how can deficiencies be addressed without creating redundant documents?
3. What options are available to address the issue of applying NEPA to CERCLA remedial actions, and what are the advantages and disadvantages of each option?

4. Taking into account the substantive requirements of both laws, as well as the desire to avoid duplicating what could be burdensome administrative procedures, what should the Air Force policy be in order to comply with both CERCLA and NEPA when remediating IRP sites at Air Force installations?

II. Literature Review

2.1 Introduction

As discussed in Chapter 1, both the National Environmental Policy Act (NEPA) and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) are complex laws that levy numerous requirements on federal agencies. This literature review will begin with a thorough analysis of NEPA, including a brief history of the legislation and the context in which it was enacted. The documentation and public review requirements of NEPA will then be described. A similar analysis and discussion will then be provided for CERCLA. Finally, this chapter will examine the similarities and differences in the documentation and public review requirements of NEPA and CERCLA.

2.2 The National Environmental Policy Act

2.2.1 Background/Overview The National Environmental Policy Act can trace its origins to a bill called the "Resources and Conservation Act," first introduced to Congress in 1959. This bill was debated by Congress periodically over the next decade as the legislators attempted to develop a consolidated national policy on the

environment. Senator Henry Jackson was a prominent participant in this debate, and on February 18, 1969 he introduced a new bill, S.1075, the National Environmental Policy Act (Parenteau, 1990: 104).

There was growing national concern at that time about the condition of the environment. There were an increasing number of massive public works projects, such as the Tennessee Tombigbee Waterway, which had the potential for significant and far-reaching environmental impacts. In addition, a major oil spill off the coast of Santa Barbara and the severe pollution of the Cuyahoga River had raised the nation's level of awareness of the declining quality of the environment. Congress responded to this concern by passing NEPA nine months after it was introduced (Parenteau, 1990: 104). Congress stated at the beginning of the Act that it recognized man's impact on the natural environment, particularly due to the pressures of population growth, high density urbanization, industrial expansion, and resource exploitation (NEPA, PL 91-190). On January 1, 1970, President Richard Nixon signed NEPA into law. It is generally recognized that this date was selected for symbolic purposes to emphasize that with the start of a new decade, the nation was embarking on a new path of environmental awareness. When signing the new law, President Nixon stated: "The 1970s absolutely must be the

years when America pays its debt to the past by reclaiming the purity of its air, its waters, and our living environment. It is literally now or never." (Wilson, 1988: 22).

The basic objectives of NEPA were to establish a national policy to prevent or eliminate damage to the environment, to ensure that informed decisions are made by federal agencies in keeping with the stated national policy, and to establish a Council on Environmental Quality (CEQ) (Rosen, 1976: 12-23). The CEQ's duties include oversight of the NEPA process and preparing an annual report to Congress and the President on existing environmental conditions across the nation, any changing trends in these conditions, and on the consistency of federal programs with the stated environmental policy contained in NEPA (Carson, 1992: 2759). After NEPA's passage, Senator Jackson stated that "no agency will [now] be able to maintain that it has no mandate or no requirement to consider the environmental consequences of its actions" (Bockrath, 1977: 123).

Although a relatively brief law, NEPA made sweeping changes in the federal decision-making process. Title I of NEPA established the first consolidated national policy on the environment, a policy that federal decision makers must consider when evaluating proposed projects within their agencies. One of the major objectives of this policy was to

help man and nature exist in "productive and enjoyable harmony" and to increase the understanding of ecosystems and natural resources. Title I states that a major goal of NEPA is the preservation of important historic, cultural, and natural aspects of our national heritage (NEPA, PL 91-190).

The National Environmental Policy Act is applicable to all federal agencies and is designed to ensure that the environmental impacts of proposed federal actions are considered during the decision-making process. In the years immediately following NEPA's passage, numerous court cases supported the view that NEPA's intent was to force federal agencies to make decisions consistent with the stated national policy contained in Title I. Since that time, however, a number of Supreme Court cases have reversed this interpretation of NEPA, and today this Act is viewed primarily as a procedural law. As long as federal agencies take certain steps in the decision-making process to ensure the impacts of each alternative action have been considered, the alternative selected by the Agency for implementation need not be the environmentally- preferred option (Burack, 1991:7; Ferester, 1992: 211-222; Twelker, 1990:121; Dreyfus, 1983: 252).

The National Environmental Policy Act does require the identification of the least damaging course of action, and this information must be made available to the public. This

provides concerned citizens and environmental and community groups with an opportunity to convince the federal agency to use its discretion and select the least damaging project alternative. The agency, however, is under no compunction to yield to public pressure, and the ultimate decision on a project is totally up to the agency decision maker (Rossman, 1990: 10176). In essence, NEPA's intent is to insure that informed decisions are made, not to dictate the final outcome of the decision-making process (Twelker, 1990: 121).

There are no criminal penalties associated with a failure to comply with NEPA, and due to its small staff, CEQ has limited enforcement authority. However, if a private citizen or group believes that an agency has not fully complied with NEPA, they can seek a preliminary injunction by showing that the proposed action could result in "irreparable injury." The courts will then review the agency's actions to determine if there was a procedural violation of NEPA. If the agency's NEPA documentation is found to be insufficient, the Court could enjoin the agency from taking any action on a project until the deficiencies are corrected (Twelker, 1990: 122-123).

2.2.2 Role of the EPA Although the CEQ has primary responsibility for NEPA enforcement, Section 309 of the Clean Air Act of 1977 established a legal link between the

U.S. Environmental Protection Agency (EPA) and NEPA, and provided EPA with a strong complementary role in the NEPA oversight process. Congress added this section to the Clean Air Act after the U.S. Department of Transportation refused to release comments on the Supersonic Transport EIS (Alm, 1988: 33). Section 309 requires EPA to review the potential impacts of almost all major federal actions and to make the results of this review available to the public. The EPA must elevate to the CEQ any proposed project that could result in unsatisfactory environmental impacts (Sanderson, 1988: 25).

President Clinton initially proposed the elimination of the CEQ. He advocated the establishment of a Department of Environmental Protection, to encompass the existing Environmental Protection Agency and to include the current functions of the CEQ. Only one CEQ function would not have been transferred to this new department. The referral function in which conflicts between federal agencies are elevated to the CEQ would have instead been elevated to the President. As part of this proposed reorganization, President Clinton has already established a new Office of Environmental Policy to provide policy advice to the President and Vice President (Bear, 1993).

However, the proposal to eliminate the CEQ met with strong opposition, particularly from environmental groups

who opposed any weakening of the NEPA oversight function. The Clinton Administration was thus unable to garner the support required in Congress to permit other federal agencies to assume CEQ's responsibilities (BNA, 1994: 1661).

2.2.3 CEQ Regulations During the years immediately following NEPA's passage, federal agencies had no clear guidance on how to comply with the procedural requirements of this law. As a result, there was no standardization in the content and format of the NEPA documentation prepared during that time period. In order to address this problem, President Carter signed Executive Order 11991 in 1977, requiring the CEQ to issue binding regulations to federal agencies on measures they must take to comply with NEPA. These regulations were to include all of the procedural requirements of NEPA, as well as the mechanisms for resolving conflicts between agencies regarding the predicted environmental impacts of proposed federal actions (Bear, 1989: 10062). The resultant regulations are contained in Title 40 Code of Federal Regulations (CFR), Parts 1500-1508. These regulations were designed to make the NEPA process more useful to decision makers and the affected public. In addition, the CEQ regulations stress paperwork reduction and the need to place emphasis on the real issues associated with implementation of a particular project (Bear, 1988:

35). These regulations have only been amended once since they were promulgated. This amendment eliminated the requirement for a worst case analysis when available information is incomplete (Bear, 1989: 10062).

The CEQ regulations require all federal agencies to develop, in consultation with the CEQ, their own procedures for implementing NEPA. These procedures must be published in the *Federal Register* for public review and comment (40 CFR 1507.3). The Air Force regulations for implementing NEPA are currently contained in AFR 19-2, *Environmental Impact Analysis Process (EIAP)*. This regulation is currently under revision. The revised regulation was reviewed by CEQ and published in 11 April 1994 edition of the *Federal Register*. Any comments received will be addressed before the regulation is finalized and approved for Air Force use.

2.2.4 Documentation Required by NEPA Section 102 of NEPA requires all federal agencies to include as part of every request to Congress for any "major Federal actions significantly affecting the quality of the human environment" a detailed statement of the anticipated environmental impacts of that action (Bausch, 1991: 95). Federal actions encompass a broad range of activities including construction of new facilities, granting a license or permit, diversion of water from a navigable river or

lake, granting funds for facilities such as airports and roads which are being constructed by state and local governments, changing the current use of federally-owned land and facilities, legislative proposals, the adoption of rules and regulations, and the signing of treaties and other international conventions or agreements. Some federal actions involve multiple agencies, but the agency with the ultimate authority to approve or reject a project is the lead agency and has the responsibility for NEPA compliance (Carson, 1992: 2759-2760; Webb and Sigal, 1992: 137).

Under NEPA and the associated CEQ regulations, three classes of documentation are identified. The document prepared in support of "major Federal actions significantly affecting the quality of the human environment" is an environmental impact statement (EIS). An environmental assessment (EA) can be prepared when there is uncertainty regarding the severity of impacts that will result from a project's implementation. An EA will result in a finding of no significant impact (FONSI), in a decision to prepare an EIS, or in a decision to drop the proposed action. A categorical exclusion (CATEX) covers those actions that are minor in scope and will clearly not result in significant environmental impacts.

2.2.4.1 <u>EISs</u> The EIS is the only document specifically referenced in NEPA. In order to comply with

NEPA, this document must contain a discussion of the following areas: adverse environmental impacts which cannot be avoided, project alternatives, "any irreversible or irretrievable commitments of resources," and the relation between the proposed short-term use of the environment and the enhancement of long-term productivity (PL 91-190, Section 102.C).

The CEQ regulations implementing NEPA provide additional guidance on the preparation of an EIS. The regulations specify that all environmental impact statements should conform to the same format: Cover Sheet, Summary, Table of Contents, Purpose and Need, Alternatives Including the Proposed Action, Affected Environment, Environmental Consequences, List of Preparers, and Appendix. The Purpose and Need section provides a brief history of the project and explains why the agency is proposing to take the action. The Alternatives section must identify all reasonable alternatives to the project, including the "no-action" alternative. Any alternatives eliminated from a detailed analysis must also be identified, along with an explanation of why they were rejected. The Affected Environment section provides a brief description of the areas that will be affected by the proposed action and alternatives. Areas included are topography, soils, geology, ground water, existing land and water use, water and air quality, climate,

terrestrial and aquatic ecology, and socioeconomics. The Environmental Consequences section then addresses impacts to each of these areas (Carson, 1992: 2761).

The EIS must identify any licenses or permits that will be required should the project be implemented. In addition, the EIS must identify the environmentally-preferred alternative, that option which would result in the fewest impacts, and the agency's preferred alternative. The federal agency, in weighing other factors, such as cost, land use plans, and schedule, may choose an alternative other than the environmentally-preferred one. However, the basis for this decision must be clearly explained in the EIS (Carson, 1992: 2760-2761).

When an Agency determines that an EIS is required for a project, it must publish a Notice of Intent (NOI) in the *Federal Register*. This Notice must include a brief description of the project, the planned scoping process, and a point of contact to obtain additional information (40 CFR 1508.22). Scoping is the process of obtaining input from the affected public and from other agencies regarding areas that they believe will be most severely impacted by a proposed project. The purpose of scoping is to ensure that problem areas are identified early and that sufficient resources are allocated to those areas requiring the most study. According to a CEQ Memorandum, scoping should

"clearly define the environmental issues and alternatives to be examined in the EIS including the elimination of nonsignificant issues" (48 FR 34263). This process is designed to ensure that the draft EIS is thorough and balanced, and that project delays will not result from an inadequate document. Public meetings and hearings are often held as part of the scoping process. However, this is not required if the federal agency has other means available to obtain public input (48 FR 34263).

After scoping, a draft EIS is prepared by the lead federal agency and distributed for review to other agencies with expertise in those areas most likely to be impacted by the proposed project. Comments must also be sought from appropriate state and local agencies, and from the affected public. Any comments received on the draft document must be evaluated during preparation of the final EIS. All substantive comments and responses are generally attached to the final EIS (40 CFR 1503.4).

The CEQ regulations require that EISs be written "in plain language and may use appropriate graphics so that decision makers and the public can readily understand them" (40 CFR 1502.8). federal agencies are urged to hire writers who can express themselves clearly and who can explain complex environmental issues in layman's terms. An interdisciplinary team should be used when preparing an EIS

so expertise is available from a wide range of areas. Environmental impact statements should be analytic, not encyclopedic and should normally be limited to 150 pages (40 CFR 1502.7). The goal is to provide the required information to the decision maker in a readily understood, succinct manner. Documents that are encyclopedic in nature are rarely read in their entirety and are thus of limited use to the decision maker or the affected public.

EISs should include quantitative analysis where possible to avoid the appearance that the document and its conclusions are arbitrary and capricious. Most of the calculations in an EIS are designed to predict the changes in environmental conditions that will result if a particular alternative is implemented. The resultant changes are then compared to the environmental standards for that area to determine if a violation could occur should the project be implemented (Carson, 1992: 2760). For example, if a proposed project will result in an increase in nitrogen oxide emissions, a major precursor for ozone, is this increase likely to result in a violation of the National Ambient Air Quality Standards for ozone? If a violation of environmental standards seems likely to occur, mitigative measures must be developed to lessen these impacts.

An EIS is most often prepared for a specific project. However, a Programmatic EIS (PEIS) can also be prepared for

groups of actions that are broad in scope, are similar in nature, and that will result in significant environmental impacts. A Programmatic EIS is generally prepared when the proposed action is a program which involves similar actions at multiple sites, multiple operations at a single site, or different but related activities at multiple sites (Sutherlin and Black, 1993). Similar actions can include those with common timing, impacts, alternatives, or methods of implementation. For example, the Nuclear Regulatory Commission prepared a PEIS for uranium milling nationwide. Most PEISs in the United States are prepared by the U.S. Army Corps of Engineers and the U.S. Forest Service. The Department of Energy (DOE) is currently preparing a PEIS to cover their Environmental Restoration and Waste Management Program. The DOE held 23 scoping meetings at various sites across the nation prior to beginning the PEIS (Webb and Sigal, 1992: 138-141).

Once a PEIS is prepared, site- or project-specific EISs or EAs can then be prepared at a later date to address site-specific impacts. The more narrowly focused EIS can incorporate by reference the PEIS, and will thus not have to repeat any information contained in the PEIS. This process is referred to as tiering and is an important mechanism for reducing paperwork, as required by the CEQ regulations (Bear, 1989: 10064).

At the conclusion of the EIS process, the federal agency involved must issue a Record of Decision (ROD) identifying the final decision, what alternatives were evaluated, the environmentally-preferred alternative, proposed mitigation, and any planned monitoring and enforcement programs. The agency must also explain how they reached their decision, what factors were considered, and how they were weighed in the decision-making process (40 CFR 1505.2).

2.2.4.2 EAs In addition to EISs, the CEQ regulations provide guidance on two other types of NEPA documents: environmental assessments (EA) and categorical exclusions (CATEX). An EA is a more concise document than an EIS and is prepared for those actions which do not qualify for a CATEX but for which there is uncertainty regarding the significance of the expected project impacts. An EA must include a discussion of the following: the need for the proposed action, alternatives considered, anticipated environmental impacts of both the proposed action and alternatives, and a list of agencies contacted (40 CFR 1508.9). In addition, the EA should also include a discussion of any mitigations that are part of the proposed action, or that were developed during the course of the analysis, and a brief discussion of the anticipated effectiveness of the mitigation (Fegley, 1989: 158).

An EA results in either a Finding of No Significant Impact (FONSI), or in a decision to prepare an EIS. A FONSI is a brief summary of the proposed action and explains why implementation of this action will not result in significant impacts to the environment. Under CEQ and AF regulations, a FONSI must be made available for public review prior to starting the proposed action (AFR 19-2, Section 11; 40 CFR 1501.4.e.1).

The determination of whether to issue a FONSI or to prepare an EIS is based on the agency's evaluation of the significance of a project's impacts. The determination of significance is based on an evaluation of both the proposed action's context and intensity. Context refers to the scope of the action and the setting in which it will occur. Will a proposed action have an impact on the national or global level, or will the impacts be site specific? Intensity refers to the severity of an impact (40 CFR 1508.27).

Factors that must be considered when evaluating intensity include unique characteristics of the proposed project site, level of controversy surrounding the project, degree of uncertainty regarding the predicted impacts, potential impacts on public health and safety, the precedent-setting nature of the project, potential impacts on historic, scientific, or cultural resources, the cumulative impacts in the area, impacts on threatened or

endangered species or their habitat, and compliance with all applicable federal, state, and local laws (Bear, 1989: 10064).

The cumulative impacts from multiple projects in the same area can also be significant and must be considered in the decision-making process. Cumulative impacts are those that "result from the incremental impact of the proposed action when added to other past, present, and reasonable likely future actions" (Bear, 1989: 10068). Cumulative impacts must consider both federal and non-federal actions in an area. Actions that significantly affect the environment include those that degrade environmental quality, curtail potential future beneficial use of the environment, conflict with long-term environmental goals, and may be localized in their effect, but nevertheless have a harmful environmental impact (Bockrath, 1977: 146). Neither NEPA or the CEQ regulations implementing NEPA differentiate between positive and negative impacts. Therefore, an EIS is also required for any project that will result in significant positive environmental impacts.

The number of EISs prepared by federal agencies each year has declined by 50% since the early 1970s. During this same time period there has been a sizable increase in the number of EAs prepared. On average, there are now approximately 450 EISs and 50,000 EAs prepared each year

(Bear, 1993). Many of these EAs resemble EISs in both content and length. The former General Counsel for the CEQ believes that many agencies prepare lengthy EAs instead of EISs to avoid the level of public involvement required by EISs. If the agency is then required by the courts to prepare an EIS, they can easily produce one from the existing EA (Bear, 1989: 10063).

2.2.4.3 CATEXs The final type of NEPA documentation described in the CEQ regulations is the categorical exclusion (CATEX). The CATEX is used for actions which do not individually or cumulatively have a significant impact on the environment. The CEQ recognized in developing NEPA regulations that most actions undertaken by federal agencies are minor in scope and do not warrant an EIS. Most decisions made by federal agencies on a daily basis do not involve "major" actions with a potential for "significant" environmental impacts. The CEQ regulations stipulate that the procedures developed by each agency for implementing NEPA must include a list of proposed CATEXs. For most federal agencies the CATEX list is fairly specific, and includes such actions as routine training and maintenance, research confined to a laboratory, and routine movement of personnel and equipment (Seymour, 1990: 393). Figure 1 can be used to determine what level of NEPA documentation should be prepared for a specific project.

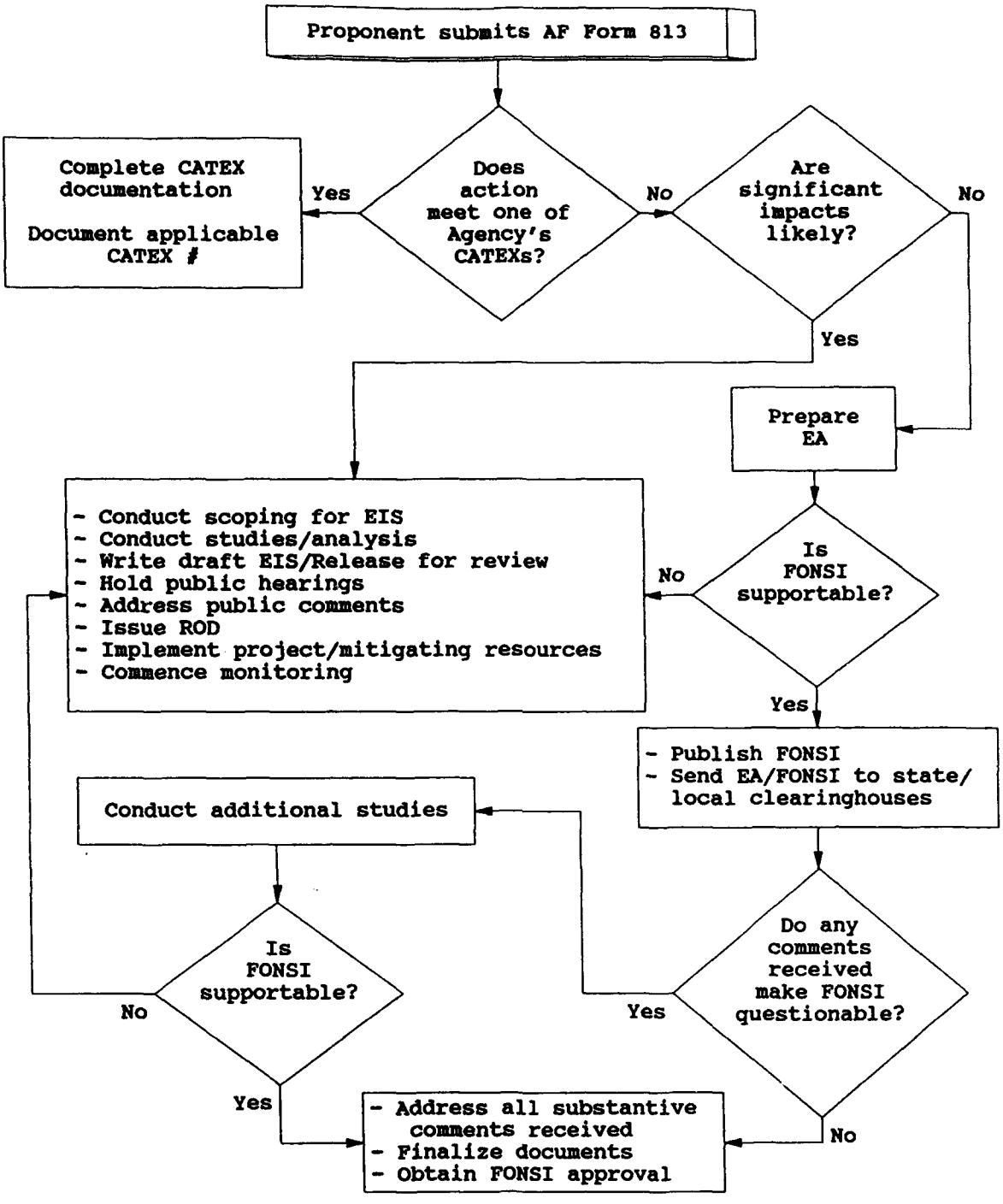

Figure 1
Decision Diagram to Determine appropriate
Level of NEPA Documentation

2.2.5 Timing of NEPA According to the CEQ regulations, NEPA must be applied to a project as early in the planning process as possible (40 CFR 1500.2, 1500.5). This is consistent with the stated goals of NEPA, one of which is to influence the federal decision-making process to ensure that informed decisions are made. If the preparation of NEPA documentation occurs after project decisions have already been made, there is clearly no chance for an informed decision to be made. In addition, applying NEPA early in the planning process can help avoid project delays. For those projects requiring an EIS, federal agencies are precluded from taking any action which would have an adverse environmental impact or which would limit the list of "reasonable alternatives" until a ROD is issued (40 CFR 1506.1).

2.2.6 Public Participation Requirements The National Environmental Policy Act requires federal agencies to seek public involvement at several stages in the decision-making process. When agencies publish their lists of proposed CATEXs in the *Federal Register*, the general public and other federal and state agencies have the opportunity to review and comment on the proposed list. Once a CATEX list is approved, there is no provision for public involvement in the subsequent use of those CATEXs.

Public involvement is also mandated when an agency prepares an EA. When an EA results in a FONSI, it must be made available to the affected public for review. For some classes of actions, a 30-day waiting period is required after publishing the FONSI before a final determination is made on the need to prepare an EIS. This waiting period is required for those actions which are precedent-setting and for those actions similar in nature to projects for which an EIS is normally prepared (40 CFR 1501.4.2). Air Force regulations also require a 30-day waiting period for projects that will occur in a floodplain or that will impact a wetland. This 30-day waiting period provides the public with ample opportunity to comment on any action that they believe will have serious environmental impacts. If public comments are significant, the federal agency may need to reconsider the project and may decide to prepare an EIS. When an EA results in a decision to prepare an EIS, the procedures for seeking public input for an EIS become effective.

When an agency determines that an EIS is required for a project, one of the first steps they must take is to publish a Notice of Intent (NOI) in the *Federal Register* (40 CFR 1501.7). The NOI informs any interested party of the intended scoping procedures to be followed for that project, including the time and location of any scoping meetings or

other means by which the agency will seek public input. The scoping process may or may not include public meetings, but the process must involve interested people at all levels of government and all interested private citizens and community groups in the affected area.

The public is thus provided with an opportunity to voice any concerns about a particular project and to state which areas they believe will be most heavily impacted by the project. The federal agency can then place special emphasis on these areas when preparing the EIS. This process is intended to ensure that problems and major issues are identified early and that issues of little importance do not consume inordinate time and resources during EIS preparation (Webb and Sigal, 1992: 139).

Notices of Intent to prepare an EIS for projects of local interest are also sent to State and local clearinghouses, local community groups, and property owners near the area to be impacted by project implementation. In addition, such notices are also generally placed in local newspapers and may be posted at the proposed project site (40 CFR 1506.6).

Once a draft EIS is completed in accordance with the criteria developed during the scoping process, the federal agency must actively seek comments from other federal, state, and local agencies and the affected public. Agencies

must actively solicit comments from any individuals who have expressed an interest in the project, either during the scoping process or during preparation of the draft EIS (40 CFR 1503.1). A copy of all draft and final EISs must be sent to the U.S. Environmental Protection Agency (EPA). The EPA must publish a weekly notice in the *Federal Register* of all EISs filed with them the previous week. This provides the public with an additional opportunity to comment on the project (40 CFR 1506.9-1506.10). If there is sufficient interest in the project, a public hearing may be held on the draft EIS.

Federal agencies are required to address all substantive comments received on draft EISs. Responses may include modifying the proposed action, analyzing new alternatives or changing existing ones, expanding on existing analyses or including additional evaluations, and making factual corrections. If a comment is not viewed by an agency as valid, the agency must explain why, and what circumstances, if any, would make them reconsider the comment. All comments received on a draft EIS are attached to the final document (40 CFR 1503.4).

At the conclusion of the EIS preparation and review process, the federal agency issues a ROD, identifying its decisions, the alternatives considered, and what mitigative measures have been adopted. This is a public document and

is provided for review to the State and local clearinghouses in the affected area (40 CFR 1505.2).

2.3 CERCLA

2.3.1 Background/Overview The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) was passed by Congress and signed into law by the President ten years after the enactment of NEPA. Like NEPA, CERCLA was passed in response to growing public concern, this time prompted by the potential threat to human health and the environment from an estimated 30,000-50,000 abandoned hazardous waste disposal sites. Events at Love Canal, New York raised the public's level of awareness of the threat posed by these sites, and Congress responded with CERCLA, one of the broadest environmental laws ever passed. As enacted, CERCLA has two primary purposes: to provide EPA with the enforcement authority and funding via taxes to clean up past hazardous waste disposal sites throughout the United States, and to provide response authority for hazardous substance spills. (Arbuckle, et. al. 1991: 471).

CERCLA is considered extremely broad in scope because it covers all environmental media, including air, surface water, ground water, and soil. This law is also triggered by any release or "threat of" release into the environment of any hazardous substance, pollutant, or contaminant. The

definition of a hazardous substance under CERCLA is far more broad than under the Resource Conservation and Recovery Act (RCRA), which governs the current management and disposal of hazardous wastes. Under CERCLA, a hazardous substance is any "designated for special consideration under the Clean Air Act (CAA), Clean Water Act (CWA), or TSCA (Toxic Substances Control Act), and any `hazardous waste' under RCRA" (Arbuckle, et. al. 1991: 472). A CERCLA release is also broadly defined to cover any means by which a substance can enter the environment, i.e. via a spill, a leak, seepage, etc.

Under CERCLA, there are two types of response actions: removal actions and remedial actions. Removal actions are short-term responses designed to minimize the potential for a release to occur. Examples of removal actions are removal of leaking drums and the installation of drainage controls. There are limits on the amount that can be spent on a removal action under CERCLA. Due to the limited scope and duration of these actions and the fact that they are time critical, removal actions do not require the normal administrative process mandated for remedial actions (Healy, 1993: 6).

Remedial actions are long-term responses at a site designed to permanently prevent any future releases from the site. Remedial actions can include such things as

incineration of hazardous substances at the site, collection of leachate and runoff, capping a landfill to reduce future infiltration at the site, and continued monitoring to ensure that the remedial actions are effective (Healy, 1993: 7).

2.3.2 National Contingency Plan The Comprehensive Environmental Response, Compensation, and Liability Act required EPA to develop a National Oil and Hazardous Substances Contingency Plan (NCP) to provide detailed steps for the entire CERCLA response program (42 USC 9605). EPA complied with this requirement and issued the NCP in 1983. As part of this Plan, EPA developed a detailed program for evaluating past waste disposal sites and determining their priority nationally for cleanup. All sites identified to EPA undergo a preliminary assessment during which data is collected from past records on the source, type, and quantity of hazardous substances which may have been disposed of at the site. This step usually does not require an on-site visit or any environmental sampling. Some sites are dismissed at this stage as posing no real threat to human health or the environment (Casagrande, 1987: 1-3).

Those sites which warrant further investigation undergo a physical site inspection. Many of these sites then undergo a more thorough evaluation and are scored under EPA's hazard ranking system (HRS) to determine how they compare nationally with other past waste disposal sites.

The HRS evaluates the potential a site poses for migration of contaminants, direct contact with contaminants, and fire/explosion potential. If the score for a site is high enough, it is placed on the National Priority List (NPL) (Gordon et. al, 1991: 491).

Once placed on the NPL, each site undergoes the following steps in accordance with the NCP: Remedial Investigation (RI), Feasibility Study (FS), Record of Decision (ROD), Remedial Design (RD), Remedial Action (RA), and long term operation and maintenance. Those sites not on the NPL must still comply with applicable state laws and may warrant further investigation. An RI and FS may be conducted at these sites, and if it is determined necessary, some form of remedial action may be undertaken (Casagrande, 1987: 1-6).

The goals of the RI are to identify and characterize the contaminant source, identify potential exposure pathways, and to identify the harm that would result if chemical exposure occurred from this site. The purpose of the FS is to develop, screen, and analyze potential remedial actions, and to select the alternative which seems best suited for the site. Information from the RI is used in the scoping process during the FS to determine the range of feasible alternatives for a particular site. Scoping is conducted in cooperation with EPA and state and local

agencies. Alternatives considered must include the no-action alternative, a range of alternatives involving various treatment options, and one or more alternatives involving containment with little or no treatment. At the conclusion of the FS, the responsible agency determines which alternative they prefer. Once approved, the selected remedial action alternative is designed and implemented (40 FR 47946, IV.B.1). The consideration of alternatives under CERCLA is very similar to the development and evaluation of alternatives required under NEPA.

Prior to the passage of CERCLA, the DOD had developed the Installation Restoration Program (IRP) to deal with past waste disposal sites at DOD installations. The DOD, as a federal agency, was not required to comply with CERCLA, although Executive Order 12088 required the Services to consult with EPA in implementing the IRP. After CERCLA was enacted, the DOD adopted certain provisions of the law and the resultant NCP (Casagrande, 1987: 1-1 - 1-9).

2.3.3 SARA In 1986 Congress passed the Superfund Amendments and Reauthorization Act (SARA), making major changes to the original legislation. Section 211 of SARA established the Defense Environmental Restoration Program (DERP). This program requires the DOD to conduct environmental restoration at its facilities on the NPL list in accordance with Section 120 of CERCLA (PL 99-499, Section

211). In addition, DOD must conduct this program in consultation with the EPA. Essentially SARA requires DOD to comply with the same CERCLA and NCP procedures for site remediation to which other federal and private organizations must adhere. A special account, the Defense Environmental Restoration Account (DERA), was established within DOD to fund environmental restoration activities at DOD installations (PL 99-499, Section 211, 2703). SARA does not address specific actions which must be taken for those DOD sites that are not on the NPL. Section 120(1)(4) of SARA states simply that state laws apply at these sites.

Executive Order (EO) 12580, *Superfund Implementation*, delegates the responsibility for CERCLA response actions to each Executive department or agency for facilities under their control or jurisdiction (EO 12580, Section 2.j). This EO makes DOD the lead agency for response actions at all DOD sites. However, under SARA, a DOD/EPA Interagency Agreement is required for remedial actions at all DOD sites on the NPL. This Agreement must be prepared no later than the time at which the ROD is prepared (Casagrande, 1987: 1-9).

2.3.4 Documentation Required by CERCLA/SARA Extensive documentation is required throughout the CERCLA remediation process. The PA of a site concludes with preparation of a report outlining the PA activities and findings. At the conclusion of the PA, the federal agency conducting the

investigation may determine that a removal action is required to prevent an imminent threat to public health or the environment. Should this occur, the agency must prepare an action memorandum explaining the site's background, the type of waste present and the threat it poses to public health, and a description of the proposed removal action. If planning for the removal action will require more than six months, an engineering evaluation/cost analysis (EE/CA) is required. This document evaluates the cost and technical concerns associated with each removal alternative considered, and it identifies the selected alternative. Once the removal actions begin, the on-scene coordinator (OSC) must prepare periodic pollution reports (POLREPS) summarizing site activities. At the conclusion of the removal action, the OSC must prepare a final report explaining the events that occurred on site, problems encountered, effectiveness of the removal action, and any recommendations for future actions (EPA, 1992: 45-48).

If the PA does not result in a decision to conduct a removal action, the next step, the SI, can begin. The SI also concludes with a report, as mandated by CERCLA. The RI and FS, in turn, each conclude with reports of the activities conducted during these phases. After completion of the RI/FS reports, the federal agency must prepare a Proposed Plan summarizing the remedial alternatives analyzed

during the RI/FS, and explaining the rationale for the selection of the preferred alternative. This document is designed to inform the public, and it should be written "in a clear and concise style and use illustrations and figures where appropriate to better summarize the information in the RI/FS" (EPA, 1992: 34). This plan must be readily understandable by the lay reader, and it should inform the public on how to obtain additional information. This plan should emphasize the fact that the agency hasn't made a final decision on the remedial alternative. Although a preferred alternative is identified in the plan, public comments are sought on all the alternatives considered. If sufficient comments are received, the agency may select a different alternative or modify the preferred alternative (EPA, 1992: 34-35).

After the public has reviewed the Proposed Plan, a responsiveness summary must then be prepared identifying significant public comments received on the Plan and the agency's response to those comments. The responsiveness summary becomes part of the ROD (EPA, 1992: 37).

A baseline risk assessment is also required under CERCLA to address potential human and ecological risks associated with an NPL site if no remedial action is taken. In addition, the Agency for Toxic Substances and Disease Registry (ATSDR) is required to conduct a health assessment

of each site on the NPL. These assessments are used in justifying the decision to take remedial action at a site since they provide an indication of the risk to human health and the environment if no further action is taken (EPA, 1988: 3-20 - 3-23).

A Record of Decision (ROD) is generally developed at the conclusion of the RI/FS and is used to document the remedial action plan selected for implementation. The ROD must clearly explain the decision-making process used in reaching the decision and must demonstrate that the requirements of CERCLA and the NCP have been met. The principal contents of a ROD are: a review of alternatives evaluated, an explanation for how the selected level of cleanup was determined, cost estimates and evaluations for all final alternatives, a responsiveness summary explaining citizen concerns and steps taken by EPA and the state to encourage citizen participation in the process, and any future operation and maintenance of the site required. Although the DOD decision maker determines what alternative is selected at DOD sites, this decision is subject to approval by the EPA (Casagrande, 1987: 3-23). If a federal agency violates a signed IAG, they are subject to fines assessed by the EPA (Department of the Army, 1992: VI-17).

A Decision Document (DD) is similar to a ROD, but it is prepared at sites that are not listed on the NPL. The

alternative selected at these sites must comply with the requirements of applicable state and local hazardous waste requirements, but the final alternative selected for these sites is not subject to EPA approval (Department of the Army, 1992: VI-6).

Within 180 days of completion of the RI/FS for a DOD site on the NPL, the Secretary of Defense must enter into an Interagency Agreement (IAG) with the EPA Administrator (CERCLA 120(e)(2)). The purpose of this Agreement is to ensure the timely completion of the RA. The IAG must include a review of alternatives considered for remediation of a site and the alternative selected. As stated previously with the ROD, if the DOD and EPA cannot agree on an alternative, the EPA Administrator has the authority to select the alternative. The IAG also includes the proposed schedule and any planned long-term operation and maintenance of the site (Casagrande, 1987: 3-24).

2.3.5 Public Participation Requirements Opportunities for public participation are mandated at a number of steps in the NCP process. Due to their time critical nature, removal actions require less public involvement than remedial actions; however, even for removal actions, there are a number of steps intended primarily to inform, and not to seek public input.

The NCP requires the designation of a spokesperson at all removal sites to inform the public of the proposed action, to respond to any questions, and to inform the public of any releases from the site. In addition, an administrative record containing all applicable records relating to the site must be established and made available to the public. If the removal action is expected to last longer than 30 days, the administrative record must be established close to the removal site (EPA, 1992: 6).

The NCP established three categories of removal actions, and the EPA requirements for public involvement increase and build upon the requirements of the previous category. The first category includes those removal actions requiring a planning period of less than six months. For this category, during the planning period the administrative record must be made available for public review 60 days prior to the removal action and a notice of the availability of the administrative record must be published in a major local newspaper. A public comment period of 30 days is generally allowed, and all significant public comments must be addressed in writing. In addition, a spokesperson must be designated, and he or she must notify the individuals most likely to be impacted by the release as well as appropriate State and local officials (EPA, 1992: 45-50).

The second category of removal actions includes those whose on-site actions require more than 120 days to accomplish. For this category, the federal agency must develop a Community Relations Plan (CRP) in addition to adhering to all of the requirements of the first category. The CRP is based on interviews with local residents, officials, and interested parties, and it outlines the communications activities that will occur during the response action. The final category of removal actions includes those requiring a planning period of at least six months. Again, all of the requirements of the first category also apply. A CRP is also required for this category, and it must be completed prior to the completion of the engineering evaluation/cost analysis (EE/CA). Once the EE/CA is approved, an administrative record must be established and made available for public review. A 30-day public comment period is required. The agency must then prepare a responsiveness summary containing the written response to any comments received during the public comment period (EPA, 1992: 6-7, 45-50).

Requirements for public involvement are more extensive for remedial responses since these actions are far broader in scope and can cover an extended time period. During the Preliminary Assessment (PA), public involvement tends to be limited at most sites, unless there is already a high degree

of concern about the site. Local officials and concerned citizens who have expressed an interest in the site are normally notified that the PA is occurring. Key community officials, such as the mayor and city council members, should also be informed if the federal agency determines that no further action is required at this site (EPA, 1992: 29-30).

Site Inspections (SI) involve actual field visits to the site which usually generate some degree of public interest. In addition to local officials and concerned citizens, residents and business owners near the site should be informed of the impending field work. Public communication at this point is still informal and low-key. When a decision is made about the future of the site, agency officials should make an announcement to the affected community (EPA, 1992: 31).

When the Remedial Investigation/Feasibility Study (RI/FS) field work is scheduled at a site, community interviews should be conducted to gain information for the Community Relations Plan. At this time an information repository should be established for the administrative record, and a public notice must be placed in a major local newspaper informing the public of the location of the information repository. The agency may elect to hold a public meeting when the RI work plan and CRP are completed;

if public interest is insufficient to warrant this, a news release should be issued stating where the work plan can be reviewed. Informal meetings should also be held with concerned citizens and local officials as required during the FS (EPA, 1992: 32-33).

Public participation becomes far more formal after the release of the RI/FS report, and is in fact mandated by certain provisions in SARA/CERCLA. Section 117 of CERCLA clearly states that prior to adopting any plan for remedial action, the federal agency (from authority granted by EO 12580) must "publish a notice and brief analysis of the proposed plan and make such plan available to the public," provide an opportunity for the public to provide written or oral comments on the proposed plan, and conduct a public meeting near the affected location to address the proposed plan (42 USC 9617a). The NCP requires a minimum 30 day comment period for this proposed plan. All significant public comments must be addressed in writing and summarized in the Responsiveness Summary.

Notification must be published in a major local newspaper when a final remedial action plan is adopted, and the plan must be available for public review prior to initiation of remedial action. The final plan must include a response to each "significant" comment or criticism received on the proposed plan (Healy, 1993: 9). When a

final remedial action plan is adopted, any subsequent actions taken which differ significantly from the plan must be explained in a published notice (42 USC 9617b-c).

Feasibility Studies must be made available for public review and comment for a minimum of 21 days prior to selection of a remedial action. Public meetings are generally held at some point during the comment period so verbal input can be provided (40 CFR 300.67). DOD may also choose to invite public participation during the development of the Feasibility Study (Casagrande, 1987: 3-27).

Public participation is deemed so important under CERCLA that special grants are available to facilitate this participation. Section 117(e) of CERCLA states that grants of up to $50,000 may be given to any group that may be affected by a release of contaminants at any NPL site. The grants can be used to "obtain technical assistance in interpreting information with regard to the nature of the hazard", the RI/FS, ROD, RD, and proposed remedial action (42 USC 9617e).

Where feasible, DOD installations are strongly encouraged to establish a technical review committee (TRC) to review all proposed actions regarding potential releases of hazardous substances at their installation. This committee will review data collected and reports generated during the RI/FS and will provide input into the selection

of a remedial action. The TRC holds periodic public information meetings to discuss the progress of the NCP process and to address any questions. In addition, all TRC meetings are open to the public. The TRC members should include representatives from DOD, EPA, state and local agencies, and the local community (10 USC 2705c). Community representatives can include local civic leaders, the League of Women Voters, and conservation groups such as the Sierra Club.

2.4. Summary

Both NEPA and CERCLA are complex laws that levy numerous requirements on federal agencies. The requirements for documentation and public involvement mandated by these laws are quite detailed and specific. NEPA requires preparation of an EIS for all major federal actions having a potentially significant impact on the human environment. CERCLA requires the preparation of detailed documentation at the conclusion of each phase in the remedial investigation process. Public review and participation are mandated at various phases in both the NEPA and CERCLA process.

Most remedial actions taken under CERCLA qualify as a "major" federal action, thus requiring environmental impact analysis as stipulated by NEPA. Though Congress did not define "major federal action" in the NEPA legislation, the dollar amount involved in most remedial actions clearly

qualifies them as major actions. There are no provisions in the CERCLA legislation to exempt it from NEPA requirements. LEgal experts have concluded that "Unless a specific statutory provision grants express exemption from NEPA, as is the limited case in 33 U.S.C. Section 1371(c) of the Clean Water Act, NEPA would apply" (Schlechter, 1989: 1).

Using the information contained in this chapter, Chapter 3 will provide a direct comparison of NEPA and CERCLA requirements and provide a detailed listing of what is needed to meet the requirements of both laws is also provided. In Chapter 4, a model that can be used in complying with NEPA at all CERCLA sites on federal installations is described.

III. Comparison of NEPA and CERCLA Requirements

3.1 Introduction

As discussed in Chapter 2, NEPA and CERCLA were enacted for different reasons and with vastly different goals in mind. One of NEPA's goals is to identify and predict potential impacts that may result if a proposed federal project is implemented. This information, in conjunction with cost, technical, schedule, and other factors, is weighed by the decision maker in selecting a project alternative. CERCLA, on the other hand, is concerned primarily with addressing the risks posed by uncontrolled releases from inactive waste disposal sites, and with developing and evaluating alternatives to address those risks. Although passed for different reasons, there are similarities among some of the processes and documents generated under both laws. In addition, some of the terminology used by both laws is also the same, such as scoping and ROD. Information provided in Chapter 2 will be used to examine the similarities and differences in the documentation and public participation requirements of NEPA and CERCLA. In addition, the specific requirements that make a document legally sufficient under each law will be examined.

3.2 Sufficiency Criteria for NEPA Documents

A key to developing any model to address NEPA requirements at CERCLA sites is an understanding of what makes an effective NEPA and CERCLA document. The CEQ regulations do not mandate the specific documentation required for categorical exclusions (CATEXs), but as a legal document basic standards can be established. According to Freeman (1992: 79), to be effective a CATEX should include:

1) A complete description of the proposed action.

2) The degree of scoping conducted on the project, and any issues uncovered through this process. Scoping for a CATEX can be as simple as completing some type of preliminary environmental survey form. These forms are used by many federal agencies in the early stage of a NEPA analysis to identify key issues associated with a project's implementation.

3) An explanation of why the action qualifies for a CATEX under that agency's NEPA regulations. Is the action clearly included in the approved list of CATEXs for the agency involved?

4) A statement that there are no extraordinary circumstances that prohibit applying a CATEX to the proposed action. Extraordinary circumstances include such things as the presence of threatened or endangered species, wetlands, and archaeological and historic resources.

5) Requirements for compliance with other laws and regulations. For example, an action may clearly qualify for a categorical exclusion, but still require an air emissions permit to comply with the Clean Air Act. Permit and other requirements should be stated in the CATEX documentation.

As previously explained, an environmental assessment (EA) and an environmental impact statement (EIS) are far more detailed documents than a CATEX. These documents each follow the same general format and address the same issues; the CEQ regulations implementing NEPA provide a recommended format for an EIS. While this format is not mandated, the topics listed must be addressed. NEPA does not specifically discuss EAs, but they must address the same issues that an EIS does since they are prepared to determine the need for an EIS. These issues are as follows:

Purpose of and Need for Action. This section should describe the agency's goals in proposing a particular action, and why this action is required (40 CFR 1502.13). The evaluation criterion for this area is: Does the document identify the purpose of the proposed action?

Description of Proposed Alternatives, Including the Proposed Action. This section should fully describe each of the alternatives the agency considered. If any alternatives were dismissed up-front because they were technically infeasible, were completely incompatible with adjacent land

use, or were dismissed for other valid reasons, the alternative must still be briefly described along with an explanation of why it was eliminated from further consideration. Each of the remaining alternatives must be discussed in sufficient detail to enable an analysis of their environmental impact to be conducted. The no-action alternative must be included in this section. Any mitigative measures not included as part of one of the alternatives must also be included (40 CFR 1502.14). The evaluation criteria for this area are: Does the document clearly identify all reasonable alternatives? Are the alternatives described in sufficient detail to permit the required environmental impact evaluation?

Affected Environment. This section of the EIS must describe all facets of the environment which the proposed action may impact. This discussion must include, as a minimum, earth resources, land use, air, water, natural resources, cultural resources, and socioeconomics. The degree of coverage of each area should be commensurate with the anticipated level of impacts that would result from project implementation (40 CFR 1502.15). In EAs, this section can be combined with the Environmental Consequences section which follows. The evaluation criterion for this area is: Does the document include a description of each of

the required background elements in the area to be impacted by the proposed project?

Environmental Consequences. This section should describe the probable impacts that would result from implementation of each of the proposed alternatives. Like the Affected Environment section, the level of detail here should be commensurate with the expected impacts. Any adverse impacts that can not be mitigated must be identified. The cumulative impacts from each alternative must also be identified (40 CFR 1502.16). The evaluation criteria used for this area are:

a) Are the direct and indirect environmental impacts of the proposed action and all of the alternatives including the no-action alternative addressed?

b) Are the environmental impacts addressed complete? Do they address: air quality, water quality, natural resources, earth resources, cultural resources, land use, socioeconomic, and noise impacts? Is the significance of the impacts evaluated?

c) For each alternative, are any adverse effects identified that can't be avoided should the project be implemented?

d) Are irreversible and irretrievable commitments of resources identified?

e) Are the energy requirements of each alternative addressed?

f) Are mitigative measures included in the document?

Agencies/Persons to Whom Document was Sent/List of Preparers. The CEQ regulations require that all EAs and EISs include a list of agencies and organizations to whom copies of the document are sent. EISs must also include a list of preparers.

3.3 Sufficiency Criteria for RI/FS Reports

As previously discussed, extensive documentation is required for all phases of the CERCLA process. However, while documents prepared during the earlier phases of the CERCLA investigation provide valuable information for use in the RI/FS, these documents provide preliminary site information only, and the critical information in these documents is generally repeated in the RI/FS reports. Portions of the RI/FS reports meet the requirements for certain parts of a NEPA document. This section will examine what is required in the RI/FS reports to determine what areas overlap NEPA requirements.

Unlike the CEQ regulations, the Code of Federal Regulations (CFR) implementing CERCLA are not specific regarding the format required for CERCLA documents.

However, the regulations are quite specific regarding the requirements for the RI/FS process, which must be reflected in the accompanying documentation.

As stated by 40 CFR 300.430(a)(2), "The purpose of the remedial investigation/feasibility study (RI/FS) is to assess site conditions and evaluate alternatives to the extent necessary to select a remedy." During the RI phase, additional data is collected to characterize the site in order to develop and evaluate a range of potentially effective remedial actions. The selection of alternatives should be based in part on past data collected on the site and on any actions taken at the site up to that point.

The alternatives identified and selected during the scoping process for full evaluation should be described in some detail in the RI/FS report, along with their rationale for selection. The description of alternatives should include an explanation of how the alternatives selected will address the problems at the site (40 CFR 300.430.d). The evaluation criteria for this section are: Does the RI/FS report clearly evaluate all of the alternatives evaluated during this phase? Are details provided on the steps that will be taken under each alternative?

During the RI, information is also gathered regarding the human health risks and the ecological risks associated with the site. This information is used when conducting the

human risk assessment and the ecological risk assessment for the site. The risks and exposure pathways identified are used in the subsequent evaluation of the remedial action alternatives. According to 40 CFR 300.430, the lead agency must conduct field investigations of the site as part of the RI/FS to "characterize the nature of and threat posed by the hazardous substances" and to determine the extent to which a release from the site poses a threat. Field investigations must assess the following:

-Physical conditions of the site, including soil, geology, hydrogeology, meteorology, and ecology.

-Existing condition and classifications of air, surface water, and groundwater.

-Characteristics of the waste disposed of at the site. This should include the quantity, concentration, and state of material disposed of, as well as the toxicity, persistence, mobility, and tendency to bioaccumulate of each waste included.

-Degree to which the source can be characterized.

-Potential exposure pathways through all environmental media.

-Any sensitive populations or ecosystems near the site that could be impacted by wastes from the site. Any other factors relevant to characterization of the site or selection of the remedial action should also be identified.

The U.S. EPA has provided a recommended format for use in preparing RI Reports. This recommended format is contained in Appendix A.

Information from the field investigations is used in the subsequent site-specific baseline risk assessment. This

assessment evaluates the current and potential future risks to human health and the environment due to contaminants transported from the site. The data from the baseline risk assessment is then used during the Feasibility Study (FS) in evaluating various remedial alternatives.

The entire focus of the FS is the development and evaluation of a range of remedial alternatives, and this effort must be fully documented in the FS report. According to 40 CFR 300.430.e, the alternatives developed "shall reflect the scope and complexity of the remedial action under consideration and the site problems being addressed." In evaluating alternatives, the agency must establish their objectives for a site, based upon legal and regulatory requirements and risks posed from contaminants present at the site. The CERCLA regulations establish general standards which the remedial action selected must meet. For example, the maximum acceptable exposure levels for known or suspected carcinogens is a lifetime individual cancer risk of between 10^{-4} and 10^{-6} (EPA, 1988: 4-1 - 4-20).

The regulations governing the FS also require that an evaluation be conducted of risks posed to the environment, particularly to sensitive habitats of species protected by the Endangered Species Act. Regulations also require that the no-action alternative be developed, particularly for

sites at which some removal or remedial action has already occurred.

Nine criteria were developed against which all remedial alternatives developed must be evaluated during the FS process (40 CFR 300.430.e.9). These nine criteria are:

-Overall protection of human health and the environment. This includes an evaluation of both the short- and long-term abilities of the alternative to protect human health and the environment.

-Compliance with Applicable or Relevant and Appropriate Requirements (ARARs). Does the alternative comply with all identified ARARs, or is it eligible for a waiver?

-Short-Term Effectiveness - How well does the alternative protect human health and the environment during the construction and implementation phase?

-Long-term effectiveness and permanence. How much risk will remain after the alternative has been implemented? In the long-term, how reliable are the controls required under this alternative?

Reduction of Toxicity, Mobility, or Volume through Treatment -What volume of hazardous materials will be permanently destroyed or treated under this alternative, and what volume will remain?

Implementability - Is the alternative technically and administratively feasible? Are the goods and services required to implement this alternative readily available? How reliable is the technology selected under this alternative?

Cost - This includes an evaluation of up-front capital costs and continuing operation and maintenance costs for each alternative.

Community Acceptance - How willing is the surrounding community to accept the alternative? This criteria is evaluated following public comment on the RI/FS Report and proposed plan, and is based on the type and quantity of comments received.

State Acceptance - How willing are the State agencies to accept the alternative?

The U.S. EPA has also developed a recommended format for the FS Report. This format is contained in Appendix B. Although the formats provided in Appendices A and B are not mandated by regulation, the information listed in these outlines must be contained in the RI and FS reports, no matter what format is selected. If the information requested in the two outlines is contained in the RI and FS reports for a CERCLA site, these documents should be considered legally sufficient.

3.4 Documentation

3.4.1 Similarities There are distinct similarities in the analysis required by both CERCLA and NEPA and in the documentation prepared to comply with each law. Similarities and differences in both documentation and public participation requirements are summarized in Figure 2. A key element in both the NEPA and CERCLA processes is the identification of project alternatives. Both laws require the inclusion of the no-action alternative in the analyses. Information from the Remedial Investigation phase is used in scoping during the Feasibility Study to determine which alternatives are feasible for that particular site. The range of alternatives must, however, include various

Subject Area	Comparison of NEPA/CERCLA Requirements
Scoping	NEPA: -Identify major issues -Seek involvement of public, other agencies, Indian tribes -Identify alternatives CERCLA: -T[illegible]e -Public participation not mandated
Alternatives	NEPA: -Consider multiple alternatives, including no action -Fairly evaluate all alternatives CERCLA : -Consider multiple alternatives, including no action -Conduct detailed studies; may prejudice alternative selection
Extent of Analysis	NEPA: -Evaluate direct, indirect, cumulative impacts -Identify adverse impacts that can't be avoided, irreversible/ irretrievable commitment of resources -Identify social, economic, energy, cultural, and natural resource impacts CERCLA: -No analogous requirement for above impact assessments -No evaluation of impacts from remedial action implementation
Project Scope	NEPA: -Evaluate connected actions in single document CERCLA: -Break sites into multiple subunits to speed implementation of remedial action
EA/EIS & RI/FS Reports	NEPA: -EA/EIS brief, generally less than 150 pages -Readily understood by members of the general public CERCLA: -Generally very lengthy documents -Generally very technical and hard to understand for general populace

Figure 2

Similarities/Differences in NEPA/CERCLA Requirements
for Documentation and Public Participation

Public Review	NEPA: -Draft EISs released for public review -All substantive comments addressed CERCLA: -Draft RI/FS reports not released for public review -Only final reports released to public
Record of Decision	NEPA: -Prepared and approved by proponent agency CERCLA: -Prepared by proponent agency; approved by EPA -Format varies from NEPA ROD
Judicial Review	NEPA: -Can't occur until final EIS is filed or FONSI finalized CERCLA: -Can't occur until remedial action has occurred.

Figure 2 - Continued

treatment options and one or more alternatives involving containment with little or no treatment.

The Baseline Risk Assessment under CERCLA is quite similar in content to the assessment of the No-Action Alternative required under NEPA. The Baseline Risk Assessment for a site must evaluate all exposure pathways for contaminants at the site to determine what threat the site poses to the surrounding communities and the environment. Similarly, in the assessment of the no-action alternative in an EA/EIS, the impacts to human health and the environment must be assessed if no remedial action is taken at a site.

A quantitative risk assessment is also required during the FS and should be based on the same factors used in the formal Baseline Risk Assessment. The revised quantitative risk assessment reflects the residual risk remaining at a site once the remedial action has been completed. This risk assessment should be accomplished for each alternative developed for each site. Information in this assessment is very similar to some of the information required by NEPA for an EA or EIS. As in the Baseline Risk Assessment, all exposure pathways for contaminants from the site must be evaluated to determine what residual threat remains to human health and the environment if a particular remedial alternative is implemented (Cohrssen and Covello, 1989: 55-

97). The alternative having the least residual risk is likely to have the lowest long-term negative impact to human health and the environment.

Even though the scope of the analysis required by NEPA and CERCLA is different, the requirement under CERCLA to identify Applicable or Relevant and Appropriate Requirements does focus attention on many of the areas required for evaluation in an EA/EIS. For example, in addition to the specific effluent limits specified in the Clean Water Act, the Clean Air Act, etc., compliance with the Endangered Species Act should be identified as an ARAR at any site at which threatened or endangered species could be present. Similarly, compliance with the National Historic Preservation Act should also be identified as an ARAR at any site at which cultural resources could be present.

A Record of Decision (ROD) is issued under both NEPA and CERCLA. Under NEPA the ROD must include a discussion of all of the alternatives considered, identify the preferred alternative, and state whether mitigative measures have been adopted by the agency. Under CERCLA the ROD must contain a review of alternatives evaluated, an explanation for how the selected level of cleanup was determined, cost estimates and evaluations for all final alternatives, a responsiveness summary explaining citizen concerns and steps taken by EPA and the state to encourage citizen participation in the

process, and any future operations and maintenance of the site required.

3.4.2 Differences There are some fundamental differences in the implementation of NEPA and CERCLA that will present challenges in integrating the two processes. The regulations enacting NEPA specifically state that "connected actions" must be addressed within a single EIS. However, under CERCLA a single site is frequently broken up into multiple independent units, each with a separate RI/FS and ROD. The rationale for this approach is that it permits more detailed study of each of the potential problem areas at a site, and it permits cleanup of some areas while studies are still in progress at other portions of the same site. While the investigation and final remedial action taken at each site occurs independently, the combined units form a single CERCLA site (Arbuckle et. al. 1991: 480).

The timing of the development and subsequent evaluation of alternatives also differs somewhat under CERCLA and NEPA. Under NEPA, alternatives must be identified up-front, and an agency is prohibited from taking any action that could prejudice the final selection of an alternative until the NEPA analysis is complete. Under the CEQ regulations, the NEPA analysis should be conducted as early in the planning phase as possible to ensure that information on potential environmental impacts is considered prior to making a final

decision. Under CERCLA, however, detailed studies are required during the RI/FS process that are designed to influence the subsequent selection of a remedial action alternative. This entails a commitment of resources prior to completion of the analysis that will prejudice the final alternative selected, contrary to NEPA requirements.

The analyses required by NEPA and CERCLA are considerably different in scope. The CEQ regulations implementing NEPA require a thorough evaluation of a broad range of impacts that go well beyond the physical boundaries of the actual project site. The CEQ regulations require an evaluation of direct, indirect and cumulative impacts. In addition, the NEPA document must clearly identify any adverse impacts that can not be avoided, any irreversible or irretrievable commitment of resources, and the relationship between short-term use of the environment and long-term productivity. In addition, the CEQ regulations require the identification of potential conflicts between the proposed action and the "objectives of Federal, regional, State, and local...land use plans" (40 CFR 1502.16C). The energy requirements of each alternative must also be identified, as well as the requirements for natural or depletable resources. In addition, the NEPA document must assess the impact of each alternative on cultural resources and urban quality. A list of preparers is also required in NEPA

documents. There is no analogous requirement under CERCLA to include this information, and hence the information may be lacking in the CERCLA documentation. There is, however, no prohibition in CERCLA against including additional information, and it is therefore possible to produce a CERCLA document that meets all of the requirements of NEPA.

Although NEPA and CERCLA both require the evaluation of project alternatives, the range of alternatives included differs under each law. Under NEPA all "reasonable alternatives" must be included. These alternatives can include options outside of the control of the lead agency, and they may include proposals advocated by the public or members of other federal or state agencies. Any alternatives eliminated from a detailed analysis must also be identified, along with an explanation of why they were rejected. Under CERCLA, the only alternatives besides the no-action alternative which must be identified are those which are technically feasible for the site. Those alternatives involving technology under development do not have to be considered under CERCLA.

Both EAs and EISs must assess direct, indirect, and cumulative impacts from each alternative. There is no analogous requirement in the CERCLA documentation. The NEPA documents must contain an evaluation of impacts to the natural environment and to social, economic, energy, and

cultural resources and aesthetics. The CERCLA documents address some impacts to the natural environment but do not address this area in depth, and the socioeconomic, aesthetic, and cultural resource impacts are ignored.

To comply with CEQ regulations, EISs must be easily understood, fairly brief (generally less than 150 pages), and analytic, not encyclopedic. The goal is to make documents concise and to focus on those areas most likely to be impacted by a particular project. The document must be kept fairly concise if it is to be a useful tool to the decision maker. The CEQ regulations provide a recommended format for all EISs, although agencies can and often do deviate from the recommended format. In contrast to guidelines for NEPA documents, the guidance provided for RI/FS reports require a comprehensive compilation of data, resulting in lengthy documents that may not be understandable to the general public.

The requirement for addressing comments also varies somewhat between NEPA and CERCLA. Draft EISs are released for public review and comment and copies are also provided to other federal, state, and local agencies for their review and comment. The CEQ regulations require agencies to respond to all comments they receive. Responses can include modification of an existing alternative, addition of a new alternative, expansion or alteration of the existing

analysis, or an explanation of why the comment is not valid. All substantive comments and responses are included in the final EIS (Mandelker, 1992: 10.17). Under CERCLA, the draft RI and FS reports are submitted for review only to other concerned agencies, and are not released to the public until the final report is prepared. Responses to public comments received on the final reports are contained in the ROD.

The approval of a ROD also differs under CERCLA and NEPA. Under CERCLA, the ROD is prepared by the agency responsible for an NPL site, but it must be approved by the U.S. EPA. Under NEPA, the ROD or DD is prepared and approved by the proponent agency. However, if another federal agency believes an action will result in unacceptable environmental impacts, it can refer the project to the CEQ for resolution. For example, if the U.S. Forest Service completes an EIS and issues a ROD for logging in a critical habitat area for an endangered species, the U.S. Fish and Wildlife Service can request referral of the matter to the CEQ.

The judicial review permitted under NEPA and CERCLA also varies to some degree. The CEQ regulations implementing NEPA clearly state that "It is the Council's intention that judicial review of agency compliance with these regulations not occur before an agency has filed the final environmental impact statement, or has made a final

finding of no significant impact" (40 CFR 1500.3). The intent of these regulations is clearly to permit judicial review prior to project implementation, which may result in potential delays in a project's start date. Under CERCLA, on the other hand, judicial review may occur only after a remedial action has occurred (Arbuckle, et.al. 1991: 515). Therefore, under CERCLA judicial review is not permitted to delay project implementation.

3.5 Public Involvement

3.5.1 Similarities There are a number of similarities in the public involvement requirements under NEPA and CERCLA. Scoping is used under both NEPA and CERCLA, although the term has somewhat different meanings depending upon the law. Under NEPA, scoping is one of the first steps taken and is used to identify major issues on which the analysis should focus. Scoping involves the general public, other government agencies, and Indian tribes. Scoping meetings are generally held to obtain public input. Alternatives to be evaluated in the NEPA analysis are identified during the scoping process.

Under CERCLA, scoping is conducted after the Preliminary Assessment and Site Inspection and prior to the RI/FS and is tailored to the circumstances of the site, the quantity of data available, and the threat posed to human

health and the environment. Public involvement in the scoping process is not mandated by the CERCLA regulations, but the community relations requirements will generally include public involvement in this procedure.

Under NEPA, a draft EIS is released for public review and comment for a minimum of 45 days. All substantive comments received on the draft document must be addressed in the final EIS, and in fact, must be contained in the final document. Public notification of both EAs and EISs is required, and these documents must be made readily available for public review. Where there is adequate interest, a public hearing must be held to solicit comments on draft EISs. Draft EISs are also released for review by other government agencies.

Under CERCLA, an administrative record and public notification are required for removal actions and for remedial actions. The administrative record provides the public with an opportunity to review the data collected on a site and the analysis of this data. To aid in public understanding of these documents, technical grants are available to help interpret the data. A formal community relations program is required during the RI/FS process. This program is designed to actively seek public involvement.

3.5.2 Differences There are also some distinct differences in the manner and degree of public involvement under NEPA and CERCLA. Community involvement is mandated at a number of points in the CERCLA process, and public involvement is actually greater under CERCLA than NEPA. However, there are some fundamental differences in the goals and objectives in seeking public involvement. Public involvement during removal actions under CERCLA is intended primarily to inform the surrounding community of the impending action, and it is not aimed at seeking public input. No public involvement is generally sought under NEPA when a project is approved for a CATEX, the simplest level of NEPA analysis and documentation.

A formal Community Relations Plan (CRP) is required for most CERCLA actions, outlining the proposed procedures the agency will use in communicating with the public. There is no analogous requirement under NEPA. In the Notice of Intent for an EIS, however, an agency must provide details on their intended scoping procedures, including the time and location of any scoping meetings or other means by which the agency will seek public input. CERCLA, on the other hand, does not require public involvement in the scoping process to identify alternatives.

3.6 Summary

While there are some similarities in the NEPA and CERCLA requirements, it is apparent that there are also numerous differences. The model presented in Chapter 4 will present four options that can be used to comply with both laws when undertaking CERCLA remedial actions. The best option for any site will depend on past activities that have occurred at the site, on existing site conditions, and on the proposed remedial action.

IV. Model Development

4.1 Introduction

Both NEPA and CERCLA are complex laws that levy specific requirements for documentation and public participation; however, the similarities in these two laws can be used to reduce cost and schedule constraints in complying with NEPA when conducting actions under CERCLA, particularly at DOD IRP sites.

This chapter will describe a model developed for ensuring NEPA compliance when taking any action at a CERCLA site. There are two classes of action that may be taken under CERCLA: removal actions and remedial actions. Removal actions, the simplest response action under CERCLA, will be examined first. The need for these actions and the likely impact that will result from implementing them will be evaluated to determine the steps necessary to comply with NEPA. Remedial actions, long-term responses to the perceived threat from a past waste disposal site, are then similarly evaluated to determine potential NEPA strategies. Four options are presented. The first option consists of preparing a Programmatic EIS (PEIS), and then producing site-specific stand-alone NEPA documents for each CERCLA subunit, tiering off the PEIS. The second option involves eliminating the PEIS, but retaining a stand-alone NEPA

document for each CERCLA subunit. The third option entails preparing a PEIS, and then producing a combined FS/EIS report for each independent CERCLA subunit. The fourth option again eliminates the PEIS, but retains the combined FS/EIS report for each site.

4.2 Removal Actions

As explained in Chapter 2, removal actions are quick responses of limited duration designed to minimize the potential for a release to occur. Since removal actions are considered emergency operations, the documentation and public participation requirements under CERCLA are minimal. Requirements for compliance with NEPA for emergency operations are also less extensive in scope. Figure 3 provides guidance for use in complying with NEPA when undertaking emergency removal actions.

The regulations implementing NEPA specifically address emergency situations. According to the CEQ regulations, when a federal agency must take emergency actions that could result in significant environmental impacts and the time available does not permit preparation of an EIS, the agency must consult with the Council on Environmental Quality to develop "alternative arrangements" (40 CFR 1506.11). Emergency actions are limited to those steps "necessary to control the immediate impacts of the emergency" (40 CFR

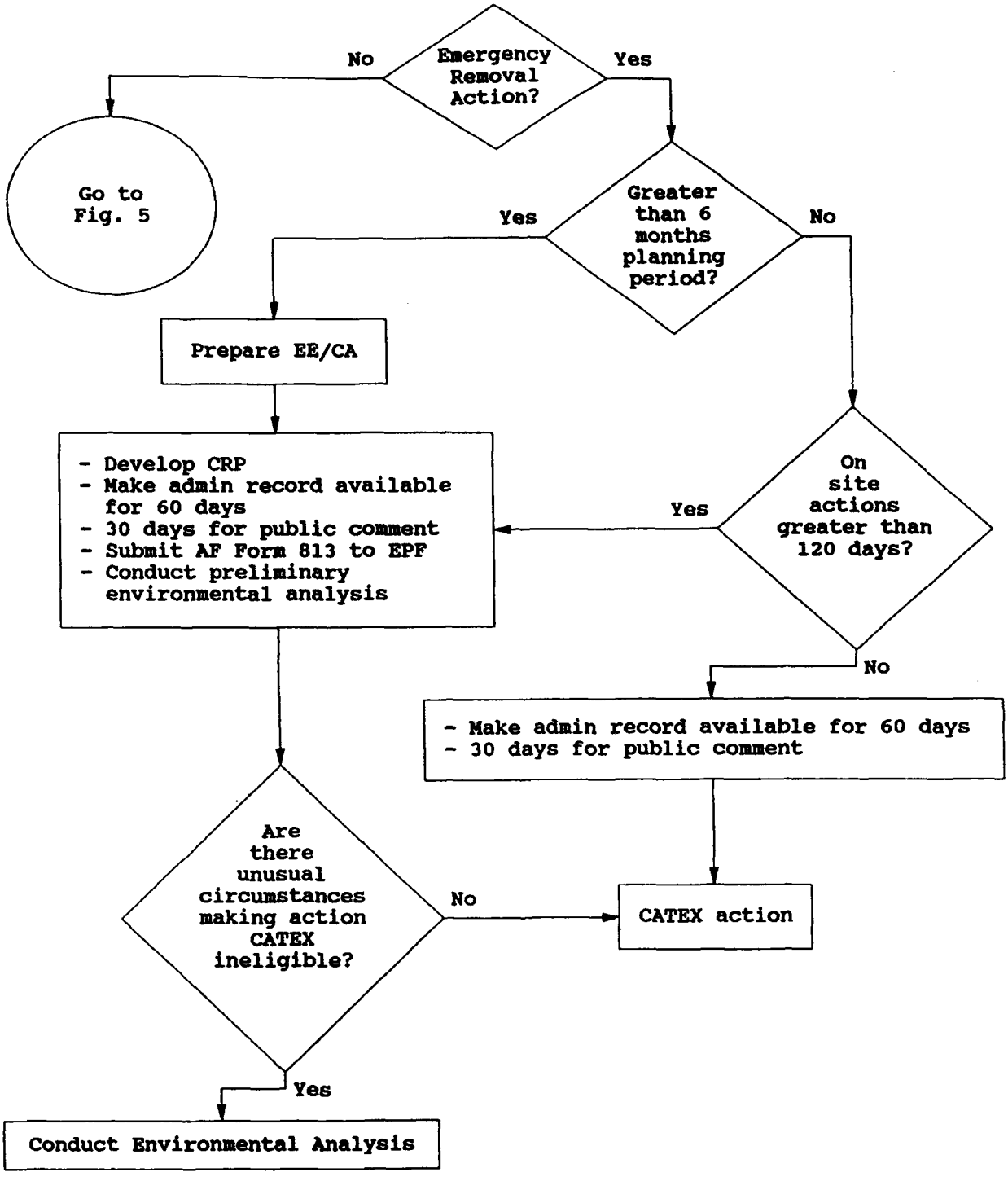

Figure 3
Decision Diagram to Determine NEPA Documentation
Required for Emergency Removal Actions

1506.11). All subsequent actions are then subject to the normal NEPA review process.

A number of court cases have also addressed the issue of compliance with NEPA for actions with severe time constraints. The Supreme Court ruled in *Flint Ridge Development Co. v. Scenic Rivers Association of Oklahoma* that when a federal agency is given a limited period of time in which they are legally required to make a decision, the Agency does not have to comply with NEPA. In this particular case the federal agency had 30 days to review a proposal and to make a decision. The Supreme Court ruled that it was not possible for the agency to prepare an EIS in this time frame. Several other federal cases have also supported the idea that federal agencies can take emergency actions when there is insufficient time to prepare an impact statement or assessment (Mandelker, 1992: 5-23).

The CEQ regulations and the related court cases clearly support the exclusion of emergency actions from the normal NEPA review procedures. The most recent draft Air Force instruction for implementing NEPA includes a special category in the list of approved CATEXs to cover emergency actions at CERCLA sites. Even if a federal agency does not have an approved CATEX to cover this situation, the CEQ regulations and court cases clearly support taking the minimum emergency action required to protect human health

and the environment without preparation of special NEPA documentation.

Some removal actions are longer in duration and may even involve six months or more of planning. In these instances, the office proposing the removal action should submit the appropriate paperwork to the Environmental Planning Function for their base to request an environmental impact analysis. At Air Force bases, this requires the completion and submittal of an AF Form 813 to the base environmental management office. Most removal actions will qualify for a CATEX, which, in the Air Force, can be approved at the base level. Any restrictions, such as the use of particular routes for construction equipment traveling to or from the site or the evacuation of nearby buildings during any waste removal processes, will be included in the CATEX justification. Some removal actions can involve unusual circumstances that may make them ineligible for a CATEX. These actions will require an environmental assessment. It is unlikely that a removal action would require an EIS.

Public involvement is not mandated by NEPA for actions that qualify for a CATEX since the list of CATEXs authorized for each federal agency has already undergone public review. However, the public involvement requirements of CERCLA must still be met.

4.3 CERCLA Remedial Actions

As explained in Chapter 2, remedial actions are long-term responses at a site designed to permanently prevent any future releases from the site. At some installations that are not on the NPL, after preliminary investigations it is determined that the site poses no threat to human health or the environment and no further action is required. In these situations no federal action is involved so there is no requirement to comply with NEPA. Other installations which must undergo an RI/FS, some action is required to comply with NEPA.

Different installations are at different points in the CERCLA compliance process, and future actions will be constrained by past decisions made at these sites. Figures 4 and 5 provide guidance for managers at these sites to use in making decisions regarding NEPA compliance. Figure 4 should be used for decision making during the investigative field; figure 5 should be used for decision making for the remedial action. Prior to initiating field work for the RI/FS phase, the site manager should submit a request for environmental impact analysis to their environmental planning office. Field studies generally qualify for a CATEX, but it is important that any special environmental constraints be identified prior to beginning field work. For example, a site may contain endangered plants which must

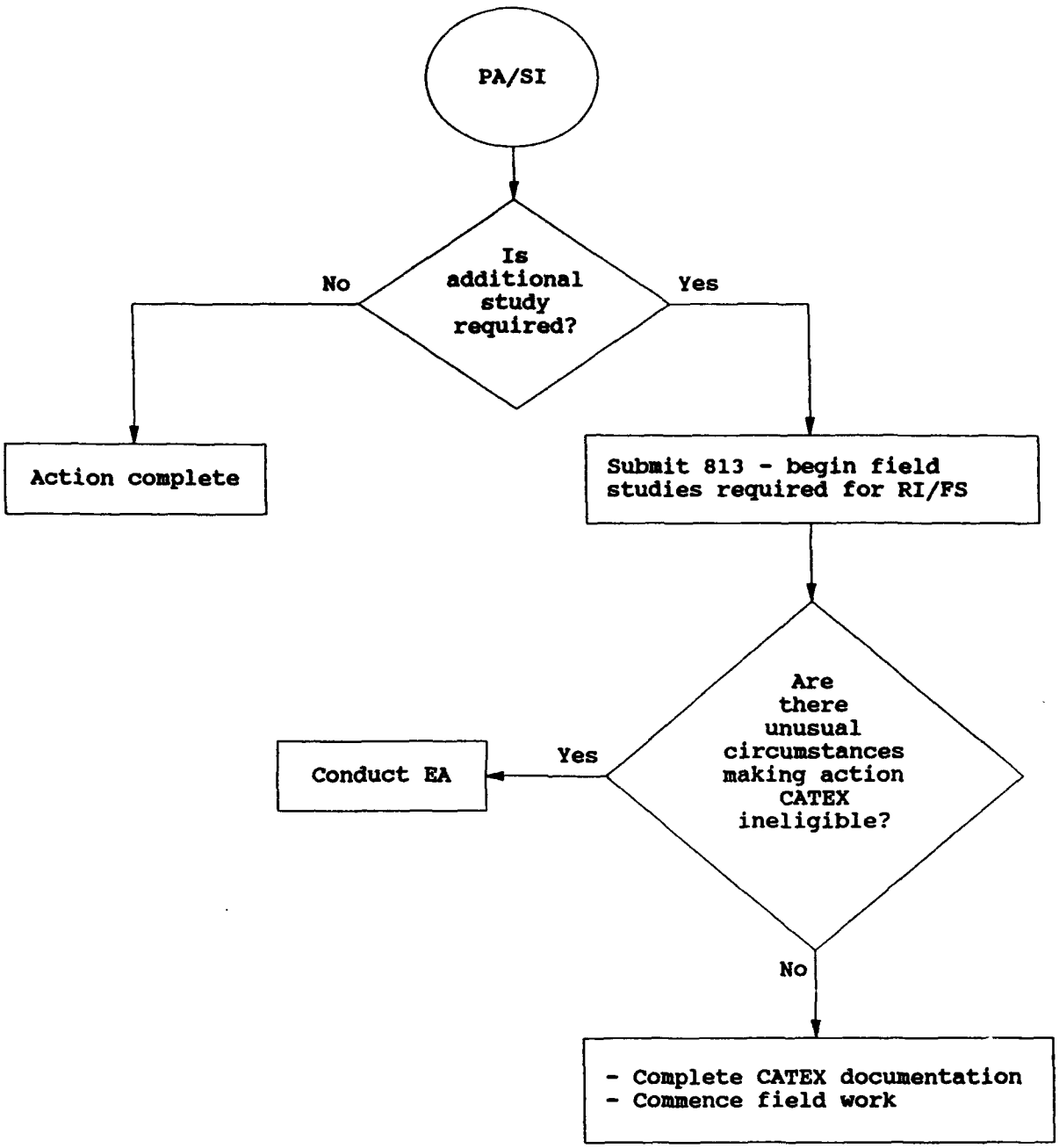

Figure 4
Decision Diagram to Determine NEPA Documentation
Required for CERCLA Field Studies

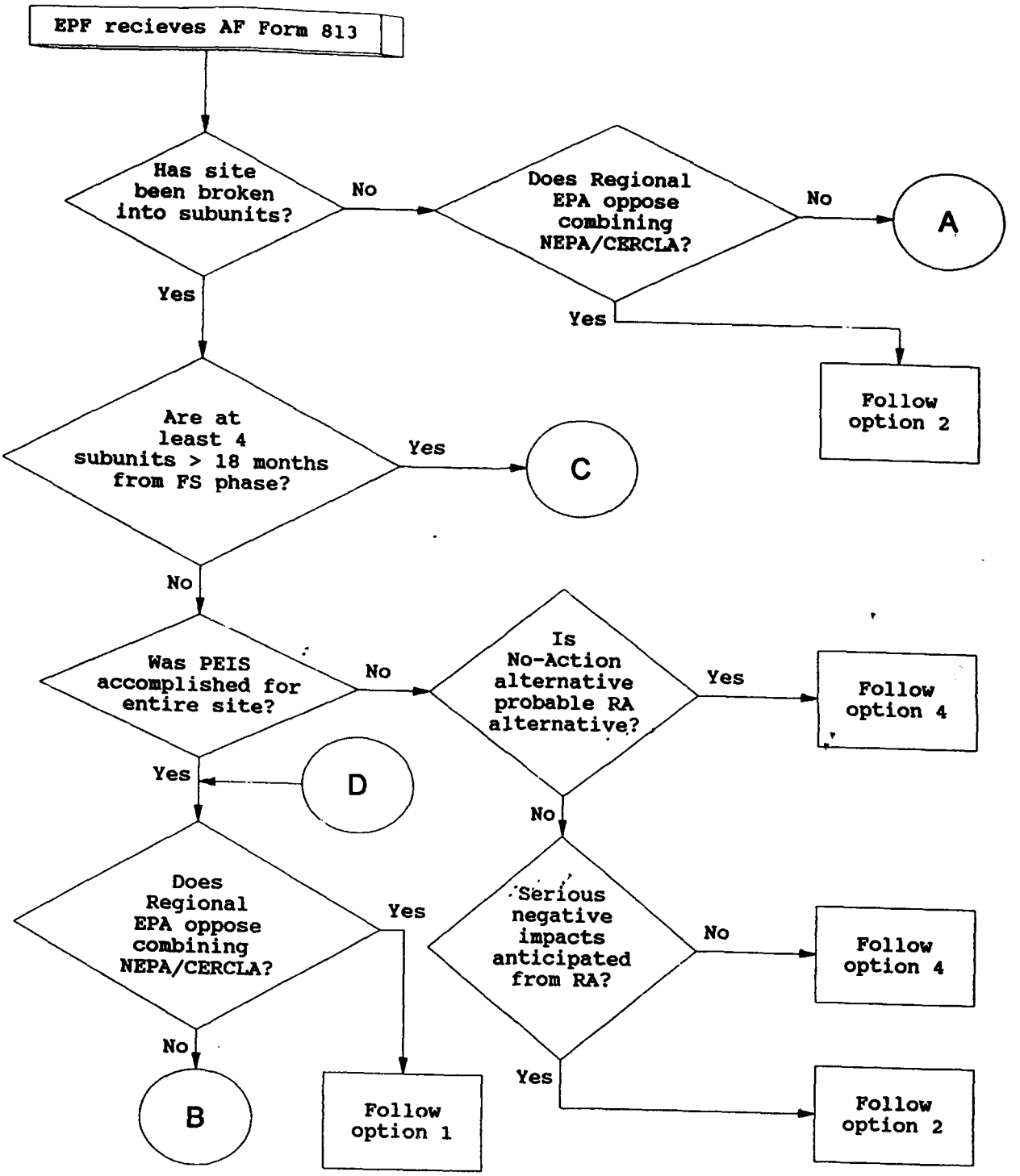

Figure 5
Decision Tree for Determing Most Effective
Options for NEPA/CERCLA Compliance

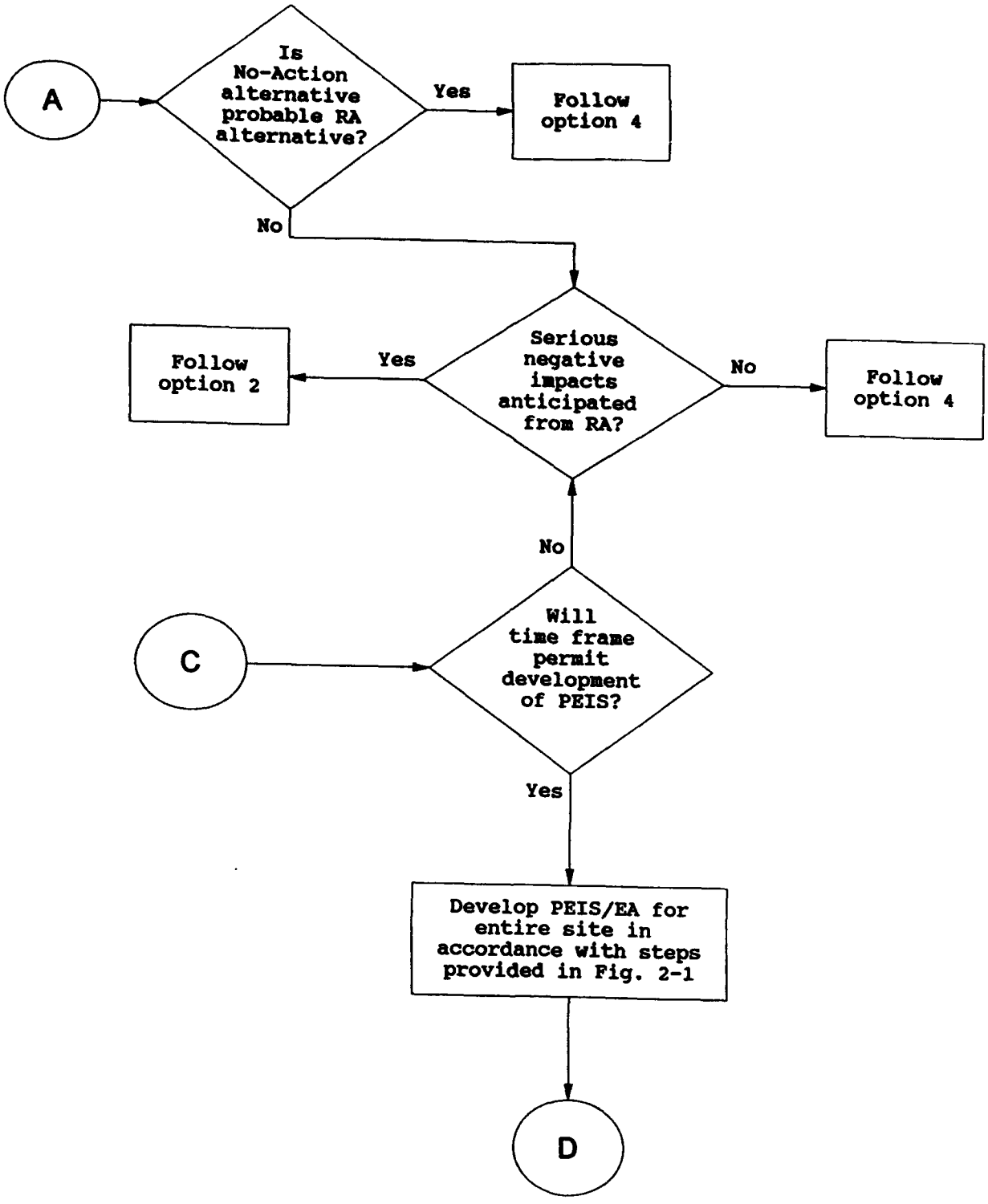

Figure 5 (cont.)

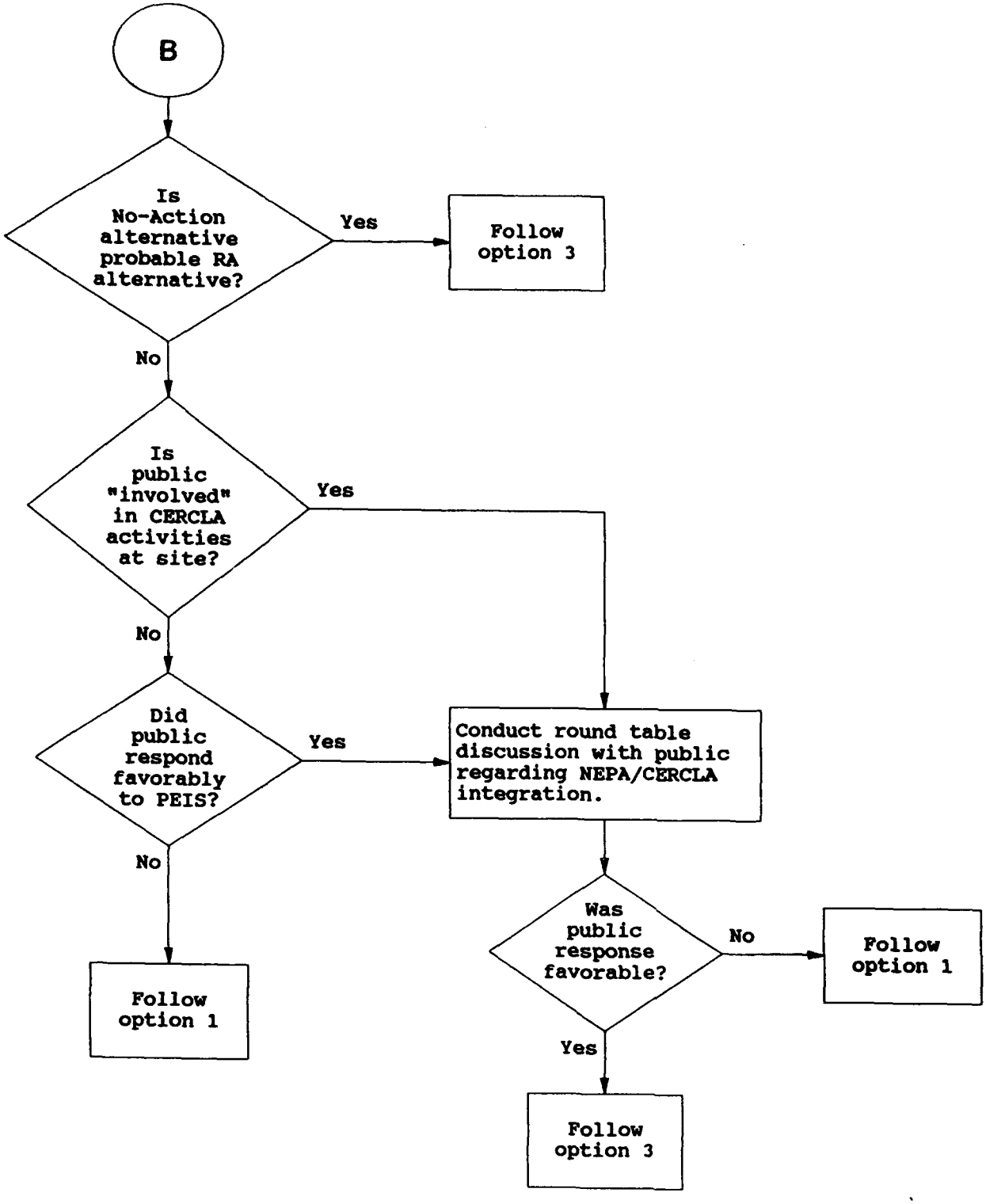

Figure 5 (cont.)

not be disturbed by drill rigs and other field equipment. Again, the most recent draft Air Force instruction governing NEPA contains a CATEX that covers CERCLA investigations.

During the early part of the FS phase, the site manager should submit a second request for environmental impact analysis to the installation environmental planning function (EPF) to cover the remedial action for the site. The NEPA analysis will occur concurrently with the FS and will use much of the data collected during the RI/FS process. There are four basic options that can be used to comply with NEPA when undertaking CERCLA remedial actions. The option selected will be determined by a number of factors, including past activities that have already occurred at the site. The goal is to comply with both NEPA and CERCLA, while maintaining a balance between cost, schedule, and public acceptance.

For ease of understanding, a few definitions of terms used in this model are provided. A site refers to the entire area, usually contiguous, that is managed by a federal agency for a specific mission. In the Air Force an example of a site is Wright-Patterson AFB. One of the Department of Energy's sites is the Fernald Feed Materials Production Center. For ease of operations, most federal agencies have divided their CERCLA sites into smaller independent subunits, based on geographic proximity and/or

similarity in the nature of the subunits. These subunits are commonly referred to as operable units.

In an ideal situation, when a site is broken into smaller independent units an agency will have the time and resources to develop a Programmatic EIS (PEIS) for the entire site, and future NEPA documents for each of the subunits can be tiered against the PEIS. Options 1 and 3 incorporate this approach. Under Option 1 a separate NEPA/CERCLA document is prepared during the RI/FS stage of investigation at each subunit. Under Option 3 a joint FS/EIS or EA report is prepared for each subunit.

For Options 2 and 4 no PEIS is prepared. These options are generally selected at sites with multiple subunits when the FS investigation is already underway at most of the subunits. In these cases, it is generally too late to prepare a PEIS for the entire site. These options are also used when a CERCLA site is not broken in to multiple subunits. Option 2 involves preparation of a separate, stand-alone NEPA document that can be incorporated in the FS Report. Although a separate EA or EIS would be prepared under this option, it would still rely heavily on data contained within the RI/FS reports. Option 4 involves preparation of a joint NEPA/CERCLA FS document.

Option 4 is used primarily for those sites in which minimal negative environmental impacts are anticipated from

the remedial action implementation, particularly to natural or cultural resources. Under Options 3 and 4 the documentation and public participation requirements of NEPA and CERCLA are combined. With this method, a single FS/EIS or FS/EA would be produced for the site. This document would diverge somewhat from the EPA recommended FS format in order to comply with the requirements of NEPA. However, all of the information required under CERCLA would still be included in the combined document. In addition, under this method, public meetings held to comply with CERCLA would also serve the requirements of NEPA. Option 4 has been used by the Department of Energy (DOE) at their CERCLA sites. Figure 6 presents these four options.

Once any option is selected, the first step is to determine if an EA or EIS should be prepared. This decision must be made based on the anticipated impacts that will result from the proposed remedial action. As discussed in Chapter 2, the determination of significance must be made based on context and intensity. If the expected impacts will be significant, an EIS is required. Any remedial action that could result in significant impacts during implementation will require an EIS. However, if the proposed remedial action is limited or is the no- further-action alternative, an EA may be adequate. If uncertain, deciding to prepare an EIS can avoid delays at a later date

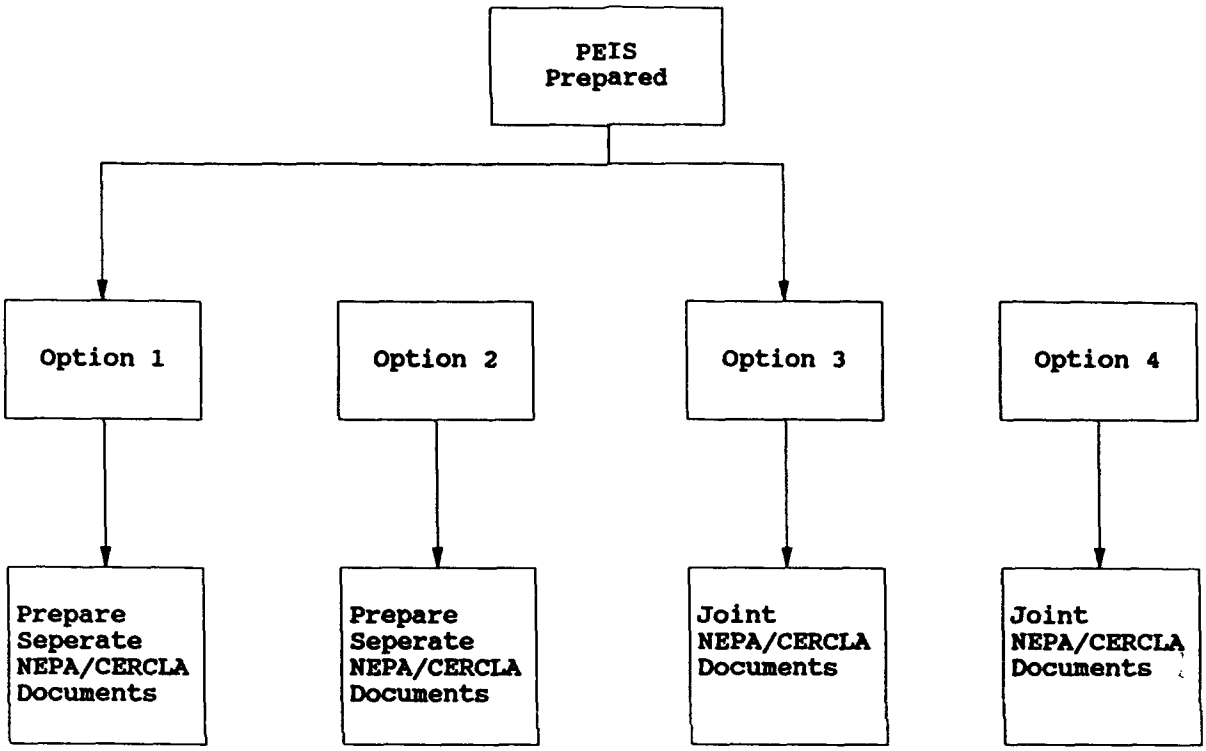

Figure 6
Four Options for Application of
NEPA to CERCLA Remedial Actions

if it is determined that an EA can not result in a Finding of No Significant Impact. If an EIS is required, a Notice of Intent must be published in the *Federal Register*.

4.3.1 Option 1 If an agency breaks down its CERCLA sites into multiple independent subunits, an increasingly common practice, a single Programmatic EIS (PEIS) should be prepared for the entire site. The entire CERCLA program at the site must be evaluated since NEPA requires the preparation of PEISs for interrelated projects that result in cumulative environmental impacts. The EIS will have to be broad in scope since each subunit could vary significantly in nature and in the level of detail known about it. Subsequent NEPA documents prepared for the remedial action at each site can tier off the PEIS once it is finalized and a ROD is approved.

In addition to tiering, the site specific EA/EIS will also rely heavily on the concept of Incorporation by Reference (40 CFR 1502.21). This process enables agencies to briefly describe in an EA/EIS data contained in another report, as long as that report is readily available for review by the affected public. As large portions of the data required under NEPA are produced by the RI/FS process, this information can be summarized in the EA/EIS, with a reference to the RI or FS report containing additional details.

The PEIS and subsequent NEPA documents prepared for each site can follow the format contained in Appendix C. This format is a minor variation on the one developed by Shipley Associates, a contractor that conducts NEPA training for the Air Force. The Shipley format has become widely used throughout the Air Force and fully complies with the requirements of NEPA.

Although separate NEPA and CERCLA documents are prepared under this option, a combined Record of Decision (ROD) can be issued. Since a single decision will be made for the site, there is no benefit to be gained by issuing separate RODs. A combined ROD must contain the information indicated in Appendix D.

As indicated in Figure 5, there are two main decision paths that can lead to the selection of Option 1, If a CERCLA site has not been split into smaller subunits, there is no need to do a PEIS since the EIS/EA prepared for the proposed remedial action would cover the entire CERCLA site. Therefore, Option 1 would not be selected. If a CERCLA site is split into a number of independent subunits, future actions taken at the site will still be constrained by past decisions. The primary constraint is at what stage each of the subunits is in the remediation process.

If a PEIS is prepared, it should reduce the cost of subsequent NEPA documents by approximately 25-35%. This is

the proportio the EIS cost required to collect and synthesize the background material that can be obtained by tiering if a PEIS is prepared. Both PEISs and EISs range in costs from $200,000 to $1,000,000. For most IRP projects, an EIS should average around $230,000, although this cost can vary markedly depending on the characteristics and complexity of the site. For this thesis, the following numbers were used:

PEIS Costs - $275,000
EIS Cost - $230,000
EIS Cost with Tiering - $150,000

The following formula was then used to determine the number of subunits that must be remaining in order for a PEIS to be cost effective:

$$PEIS + X\ EIS_t = X\ Major\ EIS_s$$

where:

PEIS - cost of PEIS for overall site
EIS_t - cost of EIS with tiering
EIS_s - cost of stand-alone EIS
X - number of subunits

In this example, the number of subunits that should be remaining for a PEIS to be cost effective was four, and that is the number used in this model. Even if the costs at a particular site vary substantially from those provided here, this formula can be used to determine the optimum number of subunits for that site.

Once the optimum number of subunits is calculated for a site, it must be determined at what stage each subunit is at

in the CERCLA remedial process. In the example given, if a PEIS has not already been accomplished for the entire CERCLA site, there should be at least four of the subunits that are more than 18 months away from the FS phase if Option 1 is to be cost effective. It typically requires 18-24 months to prepare a PEIS, and if this document is to be used for tiering at the remaining subunits, it should be ready before they enter the FS stage. If fewer than four subunits are more than 18 months from the FS stage, it would not be cost effective to prepare a PEIS.

Once a decision is made to prepare a PEIS, the decision on whether to select Option 1 or 3 is based largely on the preferences of the appropriate U.S. EPA regional office and the affected public. Some U.S. EPA regional offices do not want any NEPA language in the CERCLA documents for sites within their jurisdiction. Federal agencies in such EPA regions must follow Option 1. If the public has not been heavily involved in CERCLA activities at the site or they are not receptive to a combined NEPA/CERCLA document, Option 1 should also be followed.

4.3.1.1 Public Participation Preparation of a PEIS will involve the normal requirements for public participation as described in chapter 2. Additional requirements must be met for public participation during the subsequent preparation of an EA/EIS for each operational

unit. Both NEPA and CERCLA involve public participation at various stages in the process. Formal public involvement usually begins with the scoping process. As stated in Chapter 2, public participation ranges from public accessibility to documents for review and comment to conducting formal public hearings. Under NEPA, when an EIS is required formal scoping meetings are generally held; although public participation is not required for scoping under CERCLA, the Community Relations Plan frequently involves some public input at this point. In order to minimize the number of meetings held, a joint scoping meeting should be conducted. This should be held after the PA/SI and prior to the RI/FS. This meeting will be used to seek public input regarding the range of alternatives that should be evaluated during the RI/FS, and it should bring to light those areas that the public believes can be adversely impacted by remedial action at a site.

A second public meeting is generally held under NEPA when the draft EIS is released. This meeting will give the Agency the opportunity to explain the draft document to the members of the affected community, and to answer any questions they may have. The availability of technical grants for data interpretation of the related CERCLA documents can also be explained at this meeting. The EIS/EA should become part of the Administrative Record where it

will be readily available for public review. Formal public hearings are generally not held for an EA, but the draft document is released for public review and comment.

4.3.1.2 Advantages/Disadvantages Options 1 and 3 are the optimal methods of complying with NEPA at a CERCLA site with multiple independent subunits. These options offer the best means to comply with the NEPA requirement to evaluate the cumulative impacts from interrelated projects. These methods are also more efficient than Options 2 and 4 since the subsequent site-specific NEPA documents can tier off the PEIS. Option 1's primary advantage over Option 3 is that it doesn't require altering the normal FS report or EIS format, and it may thus be easier to understand by the affected public.

The primary drawbacks to this approach relate to timing and schedule. The preparation of a PEIS involves extra up-front expense, although the follow-on NEPA documents should be less expensive since they can tier off the PEIS. Preparation of a PEIS can also involve schedule delays. Finally, depending on the past actions already taken at a site, it may be too late to adopt this approach. If there aren't at least four subunits at the RI stage or earlier, it is too late to prepare a PEIS.

4.3.2 Option 2 This option involves developing a stand-alone NEPA document to support the proposed remedial

action at each operable unit or at the entire CERCLA site for those installations which are not broken into smaller units. No PEIS is prepared under this option. Once Option 2 is selected, the first step is to determine if an EA or EIS is required. If an EIS will be prepared, a Notice of Intent must be published in the *Federal Register*.

As in Option 1, this option relies heavily on the concept of Incorporation by Reference (40 CFR 1502.21). Relevant information obtained in the RI/FS process can be summarized in the EA/EIS. If additional information is required, the reader can be referred to the RI/FS reports, which are part of the Administrative Record and are readily available for review by the affected public. As in Option 1, a combined ROD can be issued.

Timing of the NEPA document under this option is still critical. Since the EA/EIS is to be used by the decision-maker in selecting an alternative as required to comply with NEPA, it must be developed concurrently with the FS report. In fact, under this option the EA/EIS should be included as a stand-alone section of the FS report. The information developed in the EA/EIS can then be used by the decision-maker in conjunction with the other information contained in the FS report to select a remedial alternative for the site. In addition to the nine evaluation criteria required for remedial alternative evaluation under CERCLA, the decision-

maker will also have information available concerning the environmental impacts associated with implementing each alternative action. All of this information will be critical in developing the ROD.

As indicated in Figure 5, there are two main paths which lead to the selection of Option 2. If a CERCLA site is not broken into smaller independent units, either Option 2 or 4 could be selected. If the site is not broken into smaller units, then an EIS is essentially the same as a PEIS at a site with multiple subunits. If the CERCLA site is located in an EPA region that is opposed to combined NEPA/CERCLA documents, Option 2 must be selected. If it is anticipated that the selected remedial action will have serious negative environmental impacts, particularly to natural or cultural resources, Option 2 should be selected. The RI and FS reports include a great deal of information on air, water, earth resources, and related areas, but they contain little, if any, information on either natural or cultural resources (The ecological risk assessments typically contain broad, qualitative data only and do not contain detailed site-specific information.). Therefore, if significant negative impacts could occur in either of these areas, it would be better to have a stand-alone NEPA document where these impacts will receive greater focus and attention. This is especially important if no PEIS has been

prepared for the overall site alerting the affected public of important natural or cultural resources that may exist.

Under some circumstances, Option 2 may also be selected at those CERCLA sites that have been split into multiple independent subunits. As stated in the discussion of Option 1, if there are fewer than four subunits that are 18 months or more from the FS stage, it is not cost-effective to prepare a PEIS, and Option 2 should be selected.

4.3.2.1 Public Participation The public participation method for Option 2 would be the same as Option 1. Joint public meetings should be held when possible. Although a separate, stand-alone NEPA document is prepared under this option, there is no real advantage to be gained by conducting separate public meetings.

4.3.2.2 Advantages/Disadvantages As with Option 1, the chief advantage is the documents produced are in the standard NEPA/CERCLA formats and are more readily understood. Consequently these documents are of greater value to the public and to the decision-maker than that produced under Options 3 or 4.

At sites with multiple operable units, Option 2 may not be optimal, but at many sites action has already been taken to comply with CERCLA and to protect public health and it is simply too late to follow Option 1. The NEPA documents prepared for each subunit can still tier off information

contained in previous documents prepared for the site. However, the requirement to evaluate cumulative impacts will be more difficult to meet under this option.

The primary disadvantage of Option 2 is that it can be more expensive than Option 4, and it does result in duplication of information reported. However, the cost differential should not be extensive since information already contained in the RI and FS reports need only be summarized in the NEPA document. Information that must be generated solely to comply with NEPA must be developed under all of these options.

4.3.3 Option 3 This option, like Option 1, involves the preparation of a PEIS for the entire CERCLA site. After the PEIS is prepared and a ROD approved, site specific documents are prepared for each independent subunit. Under Option 3, the subsequent NEPA documents are combined with the FS report using the format contained in Appendix E, modified from the EPA recommended FS Report format.

As indicated in Figure 5, there are two main decision paths that can lead to the selection of Option 3. First, if a CERCLA site has not been split into smaller subunits, there is no need to do a PEIS since the EIS/EA prepared for the proposed remedial action would cover the entire CERCLA site so Option 3 would not be appropriate. Second, if the CERCLA site has been split into a number of independent

subunits, there should be at least four subunits that are more than 18 months away from the FS stage before Option 3 is considered. Once the decision is made to prepare a PEIS, the decision to select Option 3 is based on input from the U.S. EPA and the affected public. If the affected public has been heavily involved in CERCLA actions at the site and are receptive to a combined CERCLA/NEPA document, Option 3 should be selected.

4.3.3.1 Public Participation The public participation requirements documented under Option 1 are equally applicable to Option 3. Joint CERCLA/NEPA public meetings should be held where possible.

4.3.3.2 Advantages/Disadvantages There are a number of advantages and disadvantages in adopting this approach to comply with NEPA when undertaking CERCLA remedial actions. As stated previously, Options 1 and 3 are the optimal methods of complying with NEPA at a CERCLA site with multiple independent subunits. These methods offer the only means to comply with the NEPA requirement to evaluate the cumulative impacts from interrelated projects.

Under Options 3 and 4 the site specific EA/EIS for each subunit can be developed concurrently with the FS report. The required modifications to the typical FS report are not extensive, and the RI/FS contractor should charge a minimal fee for the needed changes. Although additional research

will have to be conducted in those areas not typically included in an FS report, much of the data generated during the RI/FS process will meet the requirements of both NEPA and CERCLA. Since a single contractor would prepare the joint NEPA/CERCLA document, there would also be less cost involved in quality assurance and quality control.

The primary disadvantage to this approach is that the resultant FS/EIS will be an extensive document that may be more complex and harder to understand by members of the general public, contrary to the requirements of NEPA. The normal RI and FS reports are several hundred pages in length, and they do not have to written in a manner that can be understood by the lay reader (Under CERCLA, only the decision document must be readily understood by the general public.). The CEQ regulations limit a normal EIS to 150 pages; 300 pages is the limit for a project of unusual scope (40 CFR 1502.7). Clearly this limit may be exceeded in a combined document. However, frequent use of appendices for data reporting could partially address this problem.

A too lengthy, complex document could also be remedied to some extent by preparing a somewhat longer summary, and ensuring that it is understandable to the general public. The summary could focus on those areas in which members of the affected community expressed concern during the scoping process. Each area in the summary could then reference the

appropriate section of the combined FS/EIS report where additional information could be obtained.

4.3.4 Option 4 This option, which has been followed by the Department of Energy for their CERCLA sites, involves developing a consolidated FS report and EA/EIS. No PEIS is prepared under this option. The format contained in Appendix E, modified from the EPA recommended FS Report format, can be used for document preparation under Option 4. As indicated in Figure 5, there are two main criteria that can lead to the selection of Option 4. Option 4 should be selected if it is anticipated that the no-action alternative will be chosen as the remedial action for the site. This option is less expensive than Option 2, and since there is no remedial action that would result in negative environmental impacts, the special emphasis on impact evaluation that a stand-alone NEPA document provides is not necessary. Even if some type of remedial action is anticipated, if it will be limited in scope and will not result in serious impacts, particularly to natural or cultural resources, then Option 4 is still appropriate. Unfortunately, Option 4 can not be selected if the CERCLA site is located in an EPA region opposed to integrated NEPA/CERCLA documents. These same two criteria, selection of a no-action alternative or selection of a remedial action that would result in minimal environmental impacts during

implementation, are also applied to CERCLA sites that are broken into multiple subunits.

4.3.4.1 Public Participation The public participation method for Option 4 would be the same as Option 3. A joint scoping meeting should be held after the PA/SI and prior to the RI/FS. In addition, a public hearing must be held after the draft EIS is released, during which the availability of technical grants for data interpretation should be explained.

4.3.4.2 Advantages/Disadvantages Option 4 shares many of the advantages and disadvantages of Option 3. The chief advantage of this approach is that it will result in minimal cost and schedule impacts since the NEPA and CERCLA documents are combined. The primary disadvantage is that the resultant FS/EIS is an extensive document that may be difficult to understand by the general public. As stated in the discussion of Option 3, however, this disadvantage could be addressed to some extent by preparing a longer, readily understood document summary.

4.4 Conclusion

Due to the time-critical nature of removal actions, they require limited documentation and public participation under both NEPA and CERCLA. The most recent Air Force instruction for implementing NEPA includes a special

category in the list of approved CATEXs to cover emergency actions at CERCLA sites. Even if a federal agency does not have an approved CATEX to cover this situation, the CEQ regulations and court cases clearly support taking the minimum emergency action required to protect human health and the environment without preparation of special NEPA documentation.

There are four main methods that can be used to comply with NEPA when performing remedial actions under CERCLA. The first option involves preparation of a PEIS for the entire CERCLA site, with subsequent site-specific NEPA documents prepared for each subunit. Under the second option, a stand-alone NEPA document would be prepared for each CERCLA site. The third option involves preparation of a PEIS for the entire CERCLA site, with subsequent integrated NEPA and CERCLA documents for each subunit. The fourth option is the same as option three, but eliminates the preparation of a PEIS. The combined FS/EIS would alter the EPA recommended FS report format to include information required under NEPA. The selection of the appropriate option for a specific site should be made using Figure 5.

V. Findings and Recommendations

5.1 Introduction

Chapters 2 and 3 of this thesis provided detailed background and comparison information on the requirements both NEPA and CERCLA. Chapter 4 used this information in developing a model with four different options that can be used to comply with NEPA when undertaking CERCLA investigations and remedial actions. This chapter will use the information provided in Chapters 2 through 4 to answer the research questions posed in Chapter 1.

5.2 Research Questions

5.2.1 Question #1 What is the current official Air Force policy on the applicability of NEPA to CERCLA remedial actions?

The Headquarters U.S. Air Force policy on the applicability of NEPA to CERCLA remedial actions has been limited to the publication of the January 1992 U.S. Air Force Installation Restoration Program Remedial Project Manager's Handbook. Chapter 3 of this handbook states:

> The Department of Justice has determined that NEPA does not apply to CERCLA actions. Therefore, components are no longer required to comply with NEPA while undertaking a cleanup. The Deputy Assistant Secretary of Defense (Environment) [DASD(E)] however, believes that certain features of the NEPA process, not specifically required by the NCP, provide valuable

> information for decision makers (i.e., effects on cultural/natural resources) (Department of the Air Force, 1992: 3-1).

This lack of clear direction has left each base to develop their own methods for complying with NEPA when undertaking CERCLA actions. The Department of Justice statement, never accepted by the CEQ, has resulted in interpretive disagreement among NEPA experts (Wagner and Benson, 1992: 112). While this issue is being worked out, it is important to look at the requirements of both laws. As discussed in Chapter 3 of this thesis, the documentation prepared under CERCLA does not meet all of the requirements of NEPA. The CERCLA analysis and documentation focus on impacts that have and will occur due to past waste disposal activities; it does not address impacts that will result from the actual implementation of a remedial action. Finally, the CERCLA legislation does not waiver the requirements of NEPA, and some means must therefore be found to comply with all of NEPA's requirements.

5.2.2 Question #2 The Department of Energy (DOE) has initiated CERCLA actions at a number of their sites. What is the DOE policy for applying NEPA to their CERCLA remedial actions?

The Department of Energy (DOE) has issued formal direction to their installations regarding NEPA compliance when undertaking CERCLA actions. The first DOE direction in

this area was issued on October 6, 1989 as DOE Order 5400.4. This guidance clearly stated that their installations must comply with NEPA as well as CERCLA requirements when undertaking CERCLA actions. DOE Order 5400.4 directed the integration of NEPA and CERCLA requirements:

> (It) is DOE's policy to integrate the requirements of NEPA and RI/FS processes for remedial actions under CERCLA...This [RI/FS] process will be supplemental, as needed, to meet the procedural and documentational requirements of NEPA. In addition the public processes of CERCLA and NEPA will be combined (DOE, 1990: 9).

The stated DOE objective was threefold: avoid duplication of effort and minimize resources required to meet site objectives, avoid conflicts in analysis that could lead to selection of different alternatives for site remediation, and minimize the potential for delays to occur in undertaking remedial actions because the agency hasn't fully complied with NEPA's procedural requirements. The outcome of the integration process is to be a combined FS/EIS (Levine and others, 1990: 1).

To support their installations in meeting these requirements, the DOE prepared a PEIS to cover their Environmental Restoration and Waste Management Program at multiple sites across the country (Webb and Sigal, 1992: 138-141). Individual DOE sites are thus able to tier off information contained in the PEIS when preparing their site-

specific CERCLA/NEPA documents. This cuts down on the duplication of effort required at DOEs CERCLA sites.

In July 1994, the DOE issued a new Secretarial Policy on the National Environmental Policy Act. A portion of this policy addresses the application of NEPA requirements to DOE's CERCLA remedial actions. The new policy states that:

> consistent with the procedures of most other Federal agencies, the Department of Energy hereafter will rely on the CERCLA process for review of actions to be taken under CERCLA and will address NEPA values and public involvement procedures as provided (O'Leary, 1994: 4).

The provisions for addressing NEPA include the incorporation of "NEPA values" in CERCLA documents, ensuring early public involvement, and making CERCLA documents available to the public as early as possible (O'Leary, 1994: 4). The new DOE policy does state that for specific projects they may choose to integrate the NEPA and CERCLA processes. It is clear from this new policy, however, that the DOE is now moving closer to the Department of Justice viewpoint on the applicability of NEPA to CERCLA remedial actions.

5.2.3 Question #3 Given the requirements of both laws, does the CERCLA documentation cover all areas of analysis and coordination required by NEPA? If not, how can deficiencies be addressed without creating redundant documents?

As discussed in Chapter 3, there are a number of similarities in the requirements of NEPA and CERCLA. Both

laws require evaluating a wide range of project alternatives, including the no-action alternative. The evaluation of the no-action alternative under NEPA is similar in nature to the Baseline Risk Assessment required by CERCLA. A Record of Decision (ROD) is required by both NEPA and CERCLA, although the requirements for the ROD are far more extensive under CERCLA.

In spite of the similarities, the CERCLA documentation is deficient in complying with NEPA unless additions are made to the standard CERCLA RI/FS reports. NEPA requires an in-depth analysis of the direct, indirect, and cumulative impacts that would result from the range of remedial alternatives under consideration, and the area of analysis can extend well beyond the actual project site. Under CERCLA, the focus is on impacts that will occur due to past waste disposal activities at the site and the residual impacts that will remain after remedial action is taken. CERCLA does not focus attention on the impacts that will result from actual implementation of the proposed remedial action. This is, in fact, one of the major weaknesses inherent in trying to use the standard CERCLA documentation to meet NEPA requirements.

There are additional requirements levied by NEPA that are not covered by CERCLA. NEPA documents must clearly identify any adverse impacts that can not be avoided, any

irreversible or irretrievable commitment of resources, the relationship between short-term use of the environment and long-term productivity, the energy requirements of each alternative, and the requirements for natural or depletable resources. In addition, NEPA documents must assess the impact of each alternative on cultural resources and urban quality. A list of preparers is also required in NEPA documents. There is no analogous requirement under CERCLA to include this information.

There are also more subtle differences between NEPA and CERCLA which create problems in using CERCLA documentation to comply with NEPA. The timing of the analysis required by these two laws is a good example. Under NEPA, an agency is prohibited from taking any action that could prejudice the final selection of an alternative until the NEPA analysis is complete. However, under CERCLA detailed studies are required during the RI/FS process that are designed to influence the subsequent selection of a remedial action alternative. This entails a commitment of resources prior to completion of the analysis that will prejudice the final alternative selected, contrary to the spirit and intent of NEPA.

A final difference in NEPA and CERCLA requirements concerns the need for the documents produced to be understandable to members of the affected public. To comply

with CEQ regulations, EISs must be easily understood and fairly brief, generally less than 150 pages. The goal is to create documents that focus on those areas most likely to be impacted by a particular project. In contrast, the guidance provided for RI/FS reports require a comprehensive compilation of data, resulting in lengthy documents that may not be understandable to the general public.

It is certainly possible to address the deficiencies in CERCLA documents to comply with the requirements of NEPA. This is, in fact, consistent with the current DOE policy of generating joint CERCLA/NEPA documents. There are multiple formats that can be followed to produce a document that meets the requirements of both laws. Appendix E of this thesis provides a sample format that can be used to produce a combined NEPA/CERCLA document that fully complies with the critical components of both NEPA and CERCLA. Even if a combined NEPA/CERCLA document is not desired, information in the CERCLA reports can be incorporated by reference in the NEPA document prepared for a site, thus avoiding excessively redundant documents.

5.2.4 Question #4 What options are available to address the issue of applying NEPA to CERCLA remedial actions, and what are the advantages and disadvantages of each option?

As explained in Chapter 4, there are four major options available in meeting NEPA requirements when undergoing CERCLA remedial actions. The optimal option for a site depends on a number of factors, including past activities that have occurred at the site, the characteristics of the site, and the probable remedial action. In an ideal situation, when a CERCLA site is broken into smaller independent subunits, frequently referred to as operable units, the time and resources are available to accomplish a Programmatic EIS. Options 1 and 3 incorporate this approach. Under Option 1 a separate NEPA/CERCLA document is prepared during the RI/FS stage of investigation at each subunit. Under Option 3 a joint FS/EIS or EA report is prepared for each subunit.

For Options 2 and 4 no PEIS is prepared. These options are generally selected at sites with multiple subunits when the FS investigation is already underway at most of the subunits. In these cases, it is generally too late to economically prepare a PEIS for the entire site. These options are also used when a CERCLA site is not broken in to multiple subunits. Option 2 involves preparation of a separate, stand-alone NEPA document that can be incorporated in the FS Report. Although a separate EA or EIS would be prepared under this option, it would still rely heavily on

data contained within the RI/FS reports. Option 4 involves preparation of a joint NEPA/CERCLA FS document.

There are, of course, advantages and disadvantages to each of these options. Options 1 and 3 offer the only means to comply with the NEPA requirement to evaluate the cumulative impacts from interrelated projects. These methods are also more efficient than Options 2 and 4 since the subsequent site-specific NEPA documents can tier off the PEIS. Information that is equally applicable to all of the subunits does not have to be repeated in the site-specific EA/EIS. Option 1's primary advantage over Option 3 is that it doesn't require altering the normal FS report or EIS format, and it may thus be easier to understand by the affected public.

The primary drawbacks to Options 1 and 3 relate to timing and schedule. The up-front preparation of a PEIS involves extra up-front expense, although the follow-on NEPA documents should be less expensive since they can tier off the PEIS. Preparation of a PEIS can also involve schedule delays. Finally, depending on the past actions already taken at a site, it may be too late to adopt this approach.

Options 1 and 2 can be more expensive than Options 3 and 4 since separate NEPA/CERCLA documents are prepared. Due to the in-depth knowledge that they gain at a site while conducting the studies and investigations required during

the RI/FS, it will generally be most cost effective to have the RI/FS contractor prepare the stand-alone NEPA document. The cost for the NEPA documentation should range from $40-230,000, depending on the complexity of the site and whether an EA or EIS is required. This cost should be less than that normally required for an EA or EIS due to the fact that much of the data required is already obtained through the normal RI/FS process.

For sites with multiple independent subunits, it is more difficult to address the cumulative impacts that will result from remedial actions at the site under Options 2 and 4 since no PEIS is prepared. Each NEPA document prepared for each subunit must consider the cumulative impacts of remedial actions that have already occurred at previous subunits of the site.

Under Options 3 and 4, the site specific EA/EIS for each subunit can be developed concurrently with the FS report. The required modifications to the typical FS report are not extensive, and the RI/FS contractor fee for the needed changes should range from $40-100,000, again depending on the site's complexity and whether an EA or EIS is required. Although additional research will have to be conducted in these areas not typically included in an FS report, much of the data generated during the RI/FS process will meet the requirements of both NEPA and CERCLA. The

primary disadvantage to this approach is that the resultant FS/EIS will be an extensive document that may not be readily understood by members of the general public, as required by NEPA. The normal RI and FS reports are several hundred pages in length, and they do not have to written in a manner that can be understood by the lay reader.

5.2.5 Question #5 Question #5 presented in Chapter 5 was: Taking into account the substantive requirements of both laws, as well as the desire to avoid duplicating what could be burdensome administrative procedures, what should the Air Force policy be in order to comply with both CERCLA and NEPA when remediating IRP sites at Air Force installations?

The Air Force could follow the Department of Energy's lead and issue guidance directing a single approach for NEPA compliance at all of their CERCLA sites. However, this approach lacks flexibility, and it doesn't recognize the inherent differences in individual sites. As stated in Chapter 4 of this thesis, in an ideal world, all CERCLA sites with multiple independent subunits would have a programmatic environmental impact statement (PEIS) for the entire site. However, at many sites it is simply too late to prepare such a document, and there would be little value gained in doing so now.

There can be little question that the Air Force should issue policy in this area. The current lack of direction has created some confusion, and could result in a failure by some to recognize the importance of complying with NEPA's procedural requirements when undertaking CERCLA remedial actions. Using the model provided in Chapter 4 of this thesis would help ensure that the essential elements of NEPA are met, while ensuring that there is minimal redundancy and duplication of effort.

5.3 Case Study I

Options 2 and 4 are currently being used at Wright-Patterson AFB (WPAFB). The most controversial CERCLA site at WPAFB is Landfills 8 and 10. These landfills were operated from 1947 to the early 1970s, and they received general refuse from all areas of the base as well as limited quantities of hazardous wastes. After the closure of these landfills, the base constructed a military family housing area immediately adjacent and partially overlapping the two landfills. Due to the potential health risks to the adjacent community posed by this site, it was selected as the first site to undergo the RI/FS and remedial action processes at this base. Option 2 was followed at this site.

The NEPA document prepared for this site relied heavily on the same background data and analysis that fed in to the

RI/FS reports. The concept of incorporation by reference was used extensively in this NEPA document. The Purpose and Need for Action used data exclusively that was provided as input into the site background and description sections of the RI and FS reports (see Appendices A and B for RI and FS Report outlines). The data required for the RI and FS reports was more than adequate to support this section of the NEPA document. Many of the permit requirements were also obtained from input data for the FS report, although the list for the FS report was not complete.

Information for the "Process Used to Formulate Alternatives" section was obtained from the personnel in the Restoration Branch of the Office of Environmental Management who had worked on this project for many years. In addition, input data for Sections 2 and 3 of the FS Report contained information explaining how all of the potential alternatives were screened and evaluated. The NEPA document was not initiated concurrently with the RI/FS studies at this base. Therefore, alternatives were eliminated from further consideration which should have been carried through for analysis to fully comply with NEPA.

Information for the Alternatives Eliminated from Detailed Study section of the NEPA document was obtained from personnel within the Office of Environmental Management and from input data for Section 2 of the FS Report. The

Alternatives Considered section was written based on information required for Section 3.2 of the FS Report. This section of the FS report was extensive, and contained far more detail than required for the NEPA analysis. Therefore, this information was summarized, and the reader was referred to the FS Report if they wanted additional information.

Many portions of the Affected Environment portion of the NEPA document were obtained from input data for Section 1.2.1 of the FS report and from Section 2 of the RI report. Background information in the CERCLA documents was adequate for earth resources, water resources, and human health and safety, but additional research was required to supplement information in the RI/FS reports for land use and natural resources. Little or no information was available from the CERCLA documents that was useful in preparing the background information on socioeconomics, transportation, air quality, and noise.

Information that was input to Section 4 of the FS report and data from Section 6 of the RI report was extremely useful in preparing the Environmental Consequences section of the NEPA document. Again, little information was contained in these reports that was useful in the impact analysis for noise, socioeconomics, transportation, or natural resources. The information in the baseline risk assessment was extremely useful in the evaluation of the no-

action alternative. The revised risk assessment data conducted to evaluate each of the action alternatives was also valuable in the impact analysis.

Numerous charts and tables were produced for the FS report that predicted residual contaminant levels that would remain if each alternative were implemented. This data was vital in evaluating the residual risks that would remain to the surrounding environment, and was thus also used as input into the NEPA document for this site. This illustrates that separate NEPA/CERCLA documents can be produced without creating undo redundancy.

5.4 Case Study II

The Department of Energy has produced integrated NEPA/CERCLA documents at a number of their independent subunits at the Fernald, Ohio Feed and Materials Production Center. The format used for the FS/NEPA document produced varied somewhat from the sample format provided in Appendix E, but the key elements are the same. The DOE example illustrates that producing integrated documents can also be successful in complying with NEPA while undertaking CERCLA remedial actions.

5.3 Conclusion

This thesis has provided a detailed analysis of the requirements of two complex environmental laws, NEPA and CERCLA, and the numerous requirements that these laws levy. Chapter 3 of this thesis provided a comparison of the requirements of NEPA and CERCLA, and explained how many of these requirements are similar. Chapter 4 presented a model that can be used by all federal agencies in meeting NEPA's requirements while undertaking CERCLA actions. The basic concepts presented in this model are also applicable to private industry, as industry is also concerned with establishing rapport and trust with the adjacent communities, and following the basic requirements of NEPA can lead to such a relationship with the public.

APPENDIX A

EPA SUGGESTED FORMAT FOR

RI REPORT

Appendix A

EPA Suggested Format for RI Report (Source: EPA, 1988: 3-30)

Executive Summary

1. Introduction
   - 1.1 Purpose of Report
   - 1.2 Site Background
     - 1.2.1 Site Description
     - 1.2.2 Site History
     - 1.2.3 Previous Investigations
   - 1.3 Report Organization

2. Study Area Investigation

2.1 Includes field activities associated with site characterization. Includes physical and chemical monitoring of some of the following:

- 2.1.1 Surface Features (topography)
- 2.1.2 Contaminant Source Investigations
- 2.1.3 Meteorological Investigations
- 2.1.4 Surface-Water and Sediment Investigations
- 2.1.5 Geological Investigations
- 2.1.6 Soil and Vadose Zone Investigations
- 2.1.7 Ground-Water Investigations
- 2.1.8 Human Population Surveys
- 2.1.9 Ecological Investigations

2.2 Technical memoranda prepared during field activities should be included in an appendix and summarized in the report chapter.

3. Physical Characteristics of the Study Area

3.1 Determined during field activities. Include some of the following:

- 3.1.1 Surface Features
- 3.1.2 Meteorology
- 3.1.3 Surface-Water Hydrology
- 3.1.4 Geology
- 3.1.5 Soils
- 3.1.6 Hydrogeology
- 3.1.7 Demography and Land Use
- 3.1.8 Ecology

4. Nature and Extent of Contamination

4.1 Includes the site characterization results and the chemical components and contaminants in some of the following media:

- 4.1.1 Sources (lagoons, sludges, tanks, etc.)

4.1.2 Soils and Vadose Zone
4.1.3 Ground Water
4.1.4 Surface Water and Sediments
4.1.5 Air

5. Contaminant Fate and Transport
5.1 Potential Routes of Migration
5.2 Contaminant Persistence
5.2.1 If applicable, describe the estimated persistence in the study area environment, and the physical, chemical, and/or biological factors of importance for the media of interest.
5.3 Contaminant Migration
5.3.1 Factors affecting contaminant migration for the media of importance (such as sorption onto soils, solubility in water, etc.)
5.3.2 Modeling methods and results

6. Baseline Risk Assessment
6.1 Human Health Evaluation
6.1.1 Exposure Assessment
6.1.2 Toxicity Assessment
6.1.3 Risk Characterization
6.2 Environmental Evaluation

7. Summary and Conclusions
7.1 Summary
7.1.1 Nature and Extent of Contamination
7.1.2 Fate and Transport
7.1.3 Risk Assessment
7.2 Conclusions
7.2.1 Data Limitations and Recommendations for Future Work
7.2.2 Recommended Remedial Action Objectives

Appendices
A. Technical Memoranda on Field Activities
B. Analytical Data and QA/QC Evaluation Results
C. Risk Assessment Methods

APPENDIX B

EPA SUGGESTED FORMAT FOR

FS REPORT

Appendix B

EPA Suggested Format for FS Report (Source: EPA, 1988: 6-16)

Executive Summary
1. Introduction
   1.1 Purpose and Organization of Report
   1.2 Background Information (Summarized from RI Report)
   1.2.1 Site Description
   1.2.2 Site History
   1.2.3 Nature and Extent of Contamination
   1.2.4 Contaminant Fate and Transport
   1.2.5 Baseline Risk Assessment

2. Identification and Screening of Technologies
   2.1 Introduction
   2.2 Remedial Action Objectives - describes the objectives for each media of concern. For each media, the following should be discussed:
      - Contaminants of interest
      - Allowable exposure based on the risk assessment (including ARARs)
      - Development of remediation goals
   2.3 General Response Actions - For each media of interest, describe the estimation of areas or volumes to which treatment, containment, or exposure technologies may be applied.
   2.4 Identification and Screening of Technology Types and Process Options - for each media of interest, describe:
   2.4.1 Identification and Screening of Technologies
   2.4.2 Evaluation of Technologies and Selection of Representative Technologies

3. Development and Screening of Alternatives
   3.1 Development of Alternatives - discusses rationale for selection of alternatives.
   3.2 Screening of Alternatives (if conducted)
   3.2.1 Introduction
   3.2.2 Alternative 1
      3.2.2.1 Description
      3.2.2.2 Evaluation
   3.2.2 Alternative 2
      3.2.2.1 Description
      3.2.2.2 Evaluation

4. Detailed Analysis of Alternatives
   4.1 Introduction
   4.2 Individual Analysis of Alternatives

4.2.1 Alternative 1
4.2.1.1 Description
4.2.1.2 Assessment
4.2.2 Alternative 2
4.2.2.1 Description
4.2.2.2 Assessment
4.3 Comparative Analysis
Bibliography
Appendices

APPENDIX C

RECOMMENDED EIS/EA FORMAT

UNDER OPTION 1

Appendix C

Recommended EIS/EA Format Under Option 1

(Based on Shipley Format: Freeman, 1992: 12-63)

Cover Sheet - This is required to comply with CEQ regulations (40 CFR 1502.11). The cover sheet must include the title and location of the proposed action. The lead and cooperating agencies must be identified, as well as a point of contact at the agency who can provide additional project information. The cover sheet must contain a one paragraph abstract and a date by which comments on the document must be received. The cover sheet is limited to one page in length.

Table of Contents

Executive Summary - This section is required by both EPA CERCLA guidelines and by CEQ regulations (40 CFR 1502.12). The summary must address the conclusions of the report, major areas that will be impacted if the proposed alternative is implemented, any controversial areas, and issues to be resolved. The summary should be limited to 15 pages.

I. Purpose of and Need for Action

A. Project Description - This section should describe what action the agency wants to take, the proposed location, when the proposed action will occur, and why the action is necessary. Include a map of the project area. Information

contained in the RI and FS reports should be summarized here, and the reader should be referred to Section 1.2 of the RI report and Section 1.2 of the FS report if they desire additional information.

B. Decisions Needed - This section should describe precisely what decision must be made in the ROD and who will make this decision. The decision for CERCLA sites will generally involve a selection of one particular remedial action.

C. Issues - This section should summarize the scoping activities and identify any controversies likely to be generated by the proposed action. In addition, it should identify any areas in which significant impacts may result if the proposed action is implemented.

D. Federal Permits and Licenses Required - All environmental permits or licenses that will be required if any of the identified alternatives is implemented should be identified. For example, treatment and discharge of contaminated groundwater to a surface stream will require a National Pollutant Discharge Elimination System (NPDES) permit. Early identification of permit requirements is critical in avoiding subsequent project delays.

E. Introduction - This section is optional, but it does aid the reader in understanding the layout of the document. The review and comment procedures can also be included.

II. Alternatives Including Proposed Action

A. Introduction - Explain that this chapter will describe each remedial alternative developed for this site. In addition, explain that this chapter also includes a summary of the expected environmental impacts that would result from implementation of each alternative. Explain that the full discussion of impacts will be contained in Section IV, Environmental Consequences.

B. Process Used to Formulate Alternatives - Explain the procedures used in identifying all reasonable alternatives for the site. Describe the scoping process that occurred for this project and how each of the alternatives was developed. Information from Section 2 of the FS Report should be used in developing this portion of the EA/EIS.

C. Alternatives Eliminated from Detailed Study - Any alternatives identified during the scoping process that are eliminated from a full evaluation must be described as well as the rationale for eliminating them from further analysis.

D. Alternatives Considered - This section should describe each alternative in sufficient detail for the reader to understand all of the key elements involved. The descriptions provided should be site specific, and should include diagrams where appropriate. The no-action alternative must always be included. This alternative could involve a continuation of the current management practices

at the site, or it could mean that no further action will be taken at the site. This section should make clear what is meant by the no-action alternative. There must be enough detail to conduct a meaningful impact analysis comparing each option against the no-action alternative, and to sharply define the differences between each of the alternatives. Information for this section should be taken from Section 3 of the FS Report. For a full, detailed description of each alternative, the reader should be referred to Sections 2 and 3.2 of the FS Report.

E. Comparison of Alternatives - This section provides a comparison of the anticipated environmental impacts from implementation of the no-action alternative versus each of the remaining alternatives developed for this site.

F. Identification of Preferred Alternative - The agency must identify which alternative is preferred. The rationale for selection of this alternative will be placed in the ROD or FONSI.

III. Affected Environment

A. Introduction - Explain that this chapter provides the baseline data for the area that will be impacted if one of the action alternatives is selected. The baseline data describes the area as it currently exists, before any remedial action is taken. The following topic areas must be

included, although the order in which they are presented can be changed:

B. Earth Resources
C. Water Resources
D. Cultural Resources
E. Natural Resources
F. Air Quality
G. Land Use
H. Transportation
I. Noise
J. Socioeconomics
K. Human Health & Safety

Information for many of the subsections required in the Affected Environment portion of the site specific EA/EIS can be obtained from input data for Section 1.2.1 of the FS Report. For example, the FS report should contain a complete description of the earth and water resources in the area, and the ecological risk assessment should describe the natural resources present. Again, information should be summarized in the EA/EIS, and the reader should be referred to the appropriate section of the FS Report for additional information.

IV. Environmental Consequences

A. Introduction - Explain that this chapter provides the scientific basis for evaluating each of the alternatives and their probable impacts on the environment in the project area. Impacts on each of the topic areas discussed in Section III must be evaluated.

B. Earth Resources
C. Water Resources
D. Cultural Resources

E. Natural Resources
F. Air Quality
G. Land Use
H. Transportation
I. Noise
J. Socioeconomics
K. Human Health & Safety

V. List of Preparers - The names and qualifications of the major contributors to the EIS must be included.

VI. Comments - All substantive comments received on the draft EIS must be included in the final EIS, as well as the Agency's response to the comments (40 CFR 1503.4).

VII. Appendices - Any supplemental analyses or other supporting material may be included here, as required.

APPENDIX D

REQUIREMENTS FOR

A ROD

Appendix D

Requirements for a ROD (Source: EPA, 1988: 6-3 - 6-15)

1.0 Description of Porposed Action - This section should explain what remedial alternative the agency has selected, where the action will occur, how it will be implemented, and when the action will commence. In addition, the objectives or goals should be stated.

2.0 Description of Project Alternatives - This section must contian a full description of all alternatives the agency evaluated. The rationale the agency used in selecting the proposed alternative must be described, including the evaluation of environmental impacts. An explanation should be provided of how the selected alternative will meet the agency's stated objectives. This section should also provide an explanation for how the selected level of cleanup was determined.

3.0 Mitigative Measures - Describe any mitigative measures the agency has adopted to avoid or minimize environmental harm from project implementation. Discuss any monitoring procedures the agency will adopt.

4.0 Cost Estimate - Cost estimates for each of the alternatives hsould be given, along with an explanation of how they were obtained.

5.0 Responsiveness Summary - Describe citizen concerns regarding the proposed project and the agency's response to

these concerns. In addition, discuss steps taken by EPA and the state to encourage citizen participation.

6.0 Operation and Maintenance - Describe the long-term requirements for operation and maintenance of the site after the remedial action has occurred.

APPENDIX E

RECOMMENDED FORMAT FOR

FS/EIS OR EA REPORT

Appendix E

Recommended Format for FS/EIS or EA Report - Options 3 and 4

Cover Sheet - This should be the same as described under Option 1.

Table of Contents - This is required to comply with the CEQ recommended format (40 CFR 1502.10).

Executive Summary - This should be the same as described under Option 1.

1. Introduction

1.1 Purpose and Organization of Report - This section should explain that a single document is being prepared to comply with both NEPA and CERCLA. Those sections that are added to the report specifically to comply with NEPA should be clearly identified.

1.2 Background Information (Summarized from RI Report) - This section should include the information normally contained in the "Purpose and Need" and "Affected Environment" sections of an EIS (40 CFR 1502.13 and 40 CFR 1502.15, respectively). This section should fully disclose the problems associated with the site and why some form of remedial action may be needed.

1.2.1 Site Description - This should include the "Affected Environment" information required by NEPA (40 CFR 1502.15). This must include a description of earth resources (including soil, geology, and topography), water resources

(including surface and groundwater), cultural resources, natural resources (including threatened and endangered species, wetlands, unique habitat areas, etc.), air quality, land use, transportation, noise, socioeconomics, and human health and safety. As specified in the CEQ regulations, the length of discussion of each area should be commensurate with the anticipated impacts.

1.2.2 Site History - This section should describe the type and quantity of wastes disposed of at this site and the time period in which it was disposed. Information in this section is required by the EPA CERCLA guidelines, and it will also support the Need for Action information required by NEPA.

1.2.3 Nature and Extent of Contamination - This section should fully describe the extent of the problems associated with the site. This information must be adequate to support the "Purpose and Need" requirements of NEPA.

1.2.4 Contaminant Fate and Transport - This section should include a discussion of all of the contaminants found at the site, their chemical properties, and likely means of transport from the site.

1.2.5 Baseline Risk Assessment - The information in this section will cover the basic impact analysis for the no-action alternative at the site, as required by NEPA. This information is also required by the EPA CERCLA guidelines.

2. Identification and Screening of Technologies - This section will remain unchanged from the EPA recommended format for an FS Report. This section describes how the technologies are evaluated, which supports the following section entitled Development and Screening of Alternatives. Potential technologies listed for screening in this section should include those identified during the scoping process, as required by NEPA. Subsections included here are:

2.1 Introduction
2.2 Remedial Action Objectives
2.3 General Response Actions
2.4 Identification and Screening of Technology Types and Process Options
2.4.1 Identification and Screening of Technologies
2.4.2 Evaluation of Technologies and Selection of Representative Technologies

3. Development and Screening of Alternatives - In order to comply with NEPA, this section must be expanded from the normal discussion of alternative development required by CERCLA. To comply with NEPA, this section must include a rigorous evaluation of all "reasonable alternatives," even if these alternatives are outside of the Agency's control (40 CFR 1502.14). This section must also include a description of the process used to develop these alternatives as well as a description of alternatives eliminated from detailed study and an explanation of why they were eliminated. A detailed description of each alternative must be provided.

3.1 Development of Alternatives - The rationale for selection of all alternatives carried through for analysis must be provided. The no-action alternative must always be included, in accordance with both CERCLA and NEPA requirements. The Agency's Preferred Alternative must be identified in this section.

3.2 Screening of Alternatives

3.2.1 Introduction - This section will explain the evaluation criteria used in the preliminary screening process. Alternatives should not be eliminated from further consideration by this screening process, even though that is the intent of CERCLA. However, to eliminate alternatives at this step is clearly contrary to the CEQ regulations that require a rigorous exploration and objective evaluation of all reasonable alternatives. This section should be used only to explain why the Agency has identified a particular alternative as the Preferred Alternative.

3.2.2 Alternative 1 - This section is repeated for each alternative.

3.2.2.1 Description

3.2.2.2 Evaluation

4. Detailed Analysis of Alternatives

4.1 Introduction - This section must also be altered extensively from the normal CERCLA format to include the analysis required by NEPA. This section will include the

"Environmental Consequences" information mandated by the CEQ regulations. The evaluation of impacts must consider direct, indirect, and cumulative impacts and their significance.

4.2 Individual Analysis of Alternatives - This section will include an analysis of the impacts from implementation of each alternatives on each area discussed in the Site Description (Section 1.2.1 of the FS Report). This section is one of the most critical elements in an EA/EIS. It provides the scientific and analytic basis of comparison of the alternatives. As required by the CEQ regulations, this section must include a description of any adverse environmental impacts that can't be avoided if a particular alternative is implemented, the relationship between short-term uses of the environment, and the long-term productivity. Any irreversible and irretrievable commitment of resources must also be identified. This should include a discussion about any land use restrictions that will permanently affect the future use of the site. The energy requirements of each alternative must be identified as well as any natural or depletable resource requirements. Mitigative measures must also be identified.

4.2.1 Alternative 1 - This section is repeated for each alternative.

4.2.1.1 Description

4.2.1.2 Assessment

4.3 Comparative Analysis - In accordance with the CEQ regulations, each alternative must be compared against the no-action alternative, not against one another (40 CFR 1502.14).

5. List of Preparers - This section is added strictly to meet the requirements of the CEQ regulations. The names and qualifications of the major contributors to the EIS must be included.

6. Comments - The CEQ regulations require the incorporation in a Final EIS of all substantive comments received on the draft document, as well as the Agency's response to each comment (40 CFR 1503.4). As in Options 1 and 2, the Record of Decision (ROD) can also be combined under this option.

BIBLIOGRAPHY

Alm, Alvin L. "NEPA: Past, Present, and Future," EPA Journal, 14: 32-33 (January/February 1988).

Arbuckle, J. Gordon, Mary Elizabeth Bosco, David R. Case, Elliott P. Laws, John C. Martin, Marshall L. Miller, Robert D. Moran, Russell V. Randle, Daniel M. Steinway, Richard G. Stoll, Thomas F. P. Sullivan, Timothy A. Vanderver, Jr., and Paul A.J. Wilson. Environmental Law Handbook. Rockville, Maryland. Government Institutes, Inc. 1991.

Bates, L.D. "Oak Ridge Restoration Typical of Federal Sites," Forum for Applied Research and Public Policy, 6: 27-32 (Spring 1991).

Baur, Byron D. Deputy Assistant General Counsel, USAF. Personal Correspondence. 22 October 1984.

Baur, Byron D. Deputy Assistant General Counsel, USAF. Personal Correspondence. 10 April 1986.

Bausch, Carl. "Achieving NEPA's Purpose in the 1990s," The Environmental Professional, 13: 95-99 (1991).

Bear, Dinah. "NEPA at 19: A Primer on an `Old' Law with Solutions to New Problems," Environmental Law Reporter, 19: 10060-10070 (February 1989).

Bear, Dinah. "Does NEPA Make a Difference?," EPA Journal, 14: 34-35 (January/February 1988).

Bureau of National Affairs, Inc. "CEQ NEPA Authority," Environment Reporter, 24: 1661 (21 January 1994).

Caldwell, Lynton K. "NEPA at Twenty: A Retrospective Critique," Natural Resources and Environment, 5: 6-11 (Summer 1990).

Carson, James E. "On the Preparation of Environmental Impact Statements in the United States of America," Atmospheric Environment, 26A: 2759-2768 (October 1992).

Casagrande, Daniel. Department of Defense Requirements in the Superfund Amendments and Reauthorization Act. McClean, Virginia: Office of the Secretary of Defense (Environment), 1987.

Cohrssen, John J. and Vincent T. Covello. Risk Analysis: A Guide to Principles and Methods for Analyzing Health and Environmental Risks. Washington, D.C. Council on Environmental Quality, 1989.

Council on Environmental Quality. Regulations on Implementing National Environmental Policy Act Procedures. 40 Code of Federal Regulations, 1500-1508. Washington, D.C., 29 November 1978.

Department of the Army. Environmental Law Deskbook. Report Number JA 234-1(92). Charlottesville, VA: The Judge Advocate General's School, November 1992.

Department of the Air Force. U.S. Air Force Installation Restoration Program Remedial Project Manager's Handbook. Washington: HQ USAF. January 1992.

Department of Energy. NEPA/CERCLA Integration Plan: Remedial Investigation and Feasibility Study Feed Materials Production Center. Fernald, Ohio. January 1990.

Dreyfus, Daniel A. "NEPA: The Original Intent of the Law," Journal of Professional Issues in Engineering, 109: 249-256 (October 1983).

Dreyfus, Daniel A., and Helen M. Ingram. "The National Environmental Policy Act: A View of Intent and Practice," Natural Resources Journal, 16: 243-263 (1976).

Fegley, Julie. "The National Environmental Policy Act: The Underused, Much-Abused, Compliance Tool," The Air Force Law Review, 31: 153-163 (1989).

Ferester, Philip M. "Revitalizing the National Environmental Policy Act: Substantive Law Adaptations from NEPA's Progeny," The Harvard Environmental Law Review, 16: 207-269 (1992).

Freeman, Larry H. How to Write Quality EISs and EAs. Bountiful, Utah: Shipley & Associates, 1992.

Gordon, D.E., R. Thomas, C.B. Shedrow, and M.P. Wilson. Integration of Statutory Provisions of NEPA, RCRA, and CERCLA at the Savannah River Site. Report Number WSRC-MS-90-280-REV.1. Washington, D.C.: Department of Energy, 1991.

Healy, Michael P. "Judicial Review and CERCLA Response Actions: Interpretive Strategies in the Face of Plain Meaning," The Harvard Environmental Law Review, 17: 3-95 (March 1993).

Levine, M.B., E.D. Smith, F. E. Sharples, and G.K. Eddlemon. Integrating NEPA and CERCLA Requirements During Remedial Responses at DOE Facilities. Report Number ORNL/TM-11564. Oak Ridge National Lab, Tennessee: Department of Energy, 1990.

Parenteau, Patrick A. "NEPA at Twenty: Great Disappointment or Whopping Success?," Audubon, 92: 104-108 (March 1990).

Reed, Phillip D. "CERCLA Litigation Update: the Emerging Law of Generator Liability," Environmental Law Reporter, 14: 10224-10236 (June 1984).

Rossman, Antonio. "NEPA: Not So Well at Twenty," Environmental Law Reporter, 20: 10174-10179 (May 1990).

Sanderson, Richard E. "EPA and NEPA: Cases in Point," EPA Journal, 14: 25-31 (January/February 1988).

Schlechter, Alvin E. Staff Judge Advocate. Personal Correspondance. 20 December 1989.

Seymour, John F. "DOE's Hazardous Waste Activities and Compliance with NEPA," Federal Facilities Environmental Journal, 1: 391-407 (Winter 1990-91).

Twelker, Eric. "Twenty Years of NEPA: From Decisionmaker's Aid to Decisionmaker's Dread," Land and Water Law Review, 25: 119-132 (January 1990).

United States Congress. The National Environmental Policy Act of 1969. Public Law No. 91-190. Environment Reporter, 71: 0101-0103.

United States Congress. The Comprehensive Environmental Response, Compensation, and Liability Act of 1980. 42 U.S.C. 9601-9657.

United States Congress. Superfund Amendments and Reauthorization Act of 1986. Public Law No. 99-499. Environment Reporter, 71: 0401-0415.

United States Environmental Protection Agency. Guidance for conducting Remedial Investigations and Feasibility Studies under CERCLA. OSWER directive 9355.3-01. Washington, D.C., October 1988.

United States Environmental Protection Agency. Integration of NEPA Values into CERCLA Documents. Office of Enforcement. Washington, D.C., January 1991.

United States Environmental Protection Agency. Compendium of Superfund Program Publications. EPA 540/8-91/014. Washington, D.C., November 1991.

United States Environmental Protection Agency. Community Relations in Superfund: A Handbook. EPA Directive 9230.0-03C. Washington, D.C: EPA, January 1992.

United States President. Superfund Implementation. Executive Order 12580. Washington, D.C., 23 January 1987.

Vest, Gary D. Deputy Assistant Secretary of the Air Force. "The Integration of RCRA, CERCLA, and NEPA." Address to Conference on the Scientific Challenges of NEPA: Future Directions Based on 20 Years of Experience. Knoxville, Tennessee, October 1989.

Vest, Gary D. Deputy Assistant Secretary of the Air Force. "The Future of NEPA." Address to Conference on the Scientific Challenges of NEPA: Future Directions Based on 20 Years of Experience. Knoxville, Tennessee, October 1989.

Wagner, Travis P. and Leigh A. Benson. "Compliance with NEPA at Federal Superfund Sites," The Environmental Professional, 14: 109-116 (1992).

Webb, J. Warren and Lorene L. Sigal. "Strategic Environmental Assessment in the United States," Project Appraisal, 7: 137-141 (September 1992).

Wilson, Jennifer Joy. "EPA and NEPA: Challenges and Goals," EPA Journal, 14: 22-24 (January/February 1988).

Vita

Connie L. Strobbe was born on 31 March 1959 in Charleston, West Virginia. She graduated from Ravenswood High School in Ravenswood, West Virginia in 1977 and attended Davis and Elkins College in Elkins, West Virginia, graduating with a Bachelor of Science in Environmental Science. She attended Air Force Officers' Training School and was commissioned as a Second Lieutenant in August 1982. She then attended the Air Force Institute of Technology, graduating with a Master of Science in Logistics Management in March 1984. She then worked in Chemical Defense in the Life Support Systems Program Office. She separated from active military duty in June 1988, and became a civilian employee at Wright-Patterson AFB in the Office of Environmental Management where she is responsible for overseeing base NEPA compliance.

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13. ABSTRACT *(Maximum 200 words)*

This study investigated the application of National Environmental Policy Act (NEPA) requirements to Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) actions. Similarities in the documentation and public participation requirements of NEPA and CERCLA include identification and evaluation of alternatives and public participation. Differences include document contents and timing of public participation. This study presented four options for ensuring NEPA compliance at CERCLA sites. Option one included a Programmatic Environmental Impact Statement (PEIS) with subsequent combined FS/EIS report for each subunit. Option two eliminated the PEIS, but retained a stand-alone NEPA document for each CERCLA subunit. Option three included a PEIS with a subsequent combined FS/EIS report for each subunit. Option four eliminated the PEIS but retained a combined FS/EIS report for each subunit. The model presented in this study can be used at any installation to determine the optimal approach for the site. The model's goal is to comply with NEPA and CERCLA while maintaining a balance between cost, schedule, and public acceptance.

14. SUBJECT TERMS	15. NUMBER OF PAGES
National Environmental Policy Act, NEPA, Comprehensive Environmental Response, Compensation, and Liability Act, CERCLA, Environmental Impact Analysis	155
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C	- Contract	**PR**	- Project
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